

# Railway Age Gazette

DAILY EDITION

Vol. 50. NEW YORK—JUNE 20, 1911—ATLANTIC CITY. No. 24d.

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE, BY  
THE RAILROAD GAZETTE (INC.), 83 FULTON ST., NEW YORK.CHICAGO: 417 South Dearborn St. CLEVELAND: New England Bldg.  
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published from time to time in New York, or in places other than New  
York, payable in advance and postage free:

United States and Mexico.....	\$5.00
Canada .....	6.00
Foreign Countries (excepting daily editions).....	8.00
Single Copies .....	15 cents each

Shop Edition and the eight M. M. and M. C. B. Convention Daily Issues,  
United States and Mexico, \$1.50; Canada, \$2.00; foreign, \$3.00.Engineering and Maintenance of Way Edition and the four Maintenance  
of Way Convention Daily issues, North America, \$1.00; foreign, \$2.00.Entered at the Post Office at New York, N. Y., as mail matter of the  
second class.

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PRESIDENT CURTIS showed great forbearance yesterday morning when he urged compliance with the M. C. B. standards without emphatically calling attention to the fact that if this had been done in the past, the upheaval resulting in the safety appliance legislation last year would not have taken place and the M. C. B. Association, instead of Congress and the Interstate Commerce Commission would have got the credit with the public for the promotion of safety in transportation by the adoption of satisfactory safety appliance standards. What Mr. Curtis urged has been urged time and again in and out of session, but the railways have been slow to learn the lessons of experience and have sacrificed a standard for the gratification of a personal whim or preju-

dice. In view of the past, this latest recommendation from the chair should receive consideration and be acted on. The standards should be faithfully observed, while the recommended practices which are candidates for promotion to standards should be given a fair trial and an intelligent vote on their promotion thus be made possible. In this connection, the suggestion offered that the height of the running board be referred to the committee on standards deserves especial consideration, for certainly as far as bridge and tunnel clearances and safety of trainmen are concerned, this is quite as important as that of the height of eaves, which has already been standardized.

THE figures presented yesterday by President Curtis regarding the defects in equipment found by the inspectors of the Interstate Commerce reflects no credit on railway management. As he pointed out, most of these defects could have been prevented by proper inspection and supervision on the part of railway managements. Because defects such as these are not prevented property and lives are constantly endangered and destroyed and the railways are subjected to odium because of the numerous prosecutions started against them in all parts of the country. Of course, it is not practicable to repair all defects in safety appliances on equipment in service; but it is possible, and practicable, to make a much better record than has been made in the past both in the way of keeping defective equipment out of service and of promptly taking it out of service after it becomes defective. No doubt a good many prosecutions are instituted for merely technical shortcomings of cars and engines. But if the commission and its inspectors are sometimes too zealous and stringent in applying the law, the railways often have construed it too loosely and obeyed it too laxly. The necessity of paying a fine following a successful prosecution is not the only, or perhaps the most, evil result of it. Every proceeding, successful or otherwise, is mentioned broadcast in the press, and the impression that railway managements are remiss in adopting safety measures and obeying the laws for promoting safety is deepened. A large part of the irksome regulation which has been adopted in recent years has resulted from just such causes.

THE manner of making up the printed proceedings of the M. C. B. Association is this year, for the first time, considered by the committee on Revision of Standards and Recommended Practice. The report favors the elimination of various rules and drawings which change little from year to year, but which, by their inclusion, have made the volume of the proceedings so bulky and cumbersome that it is unwieldy and inconvenient for handling or reading. It is also so thick and heavy that the ordinary binding is hardly sufficient to hold it together, and that it will not bear much service without wear or damage. The idea of the committee is that the annual volume should be confined to the proceedings of the convention, and that the other matter which has caused the volume to become so thick should be printed as separate pamphlets. These are the code of interchange rules; the decisions of the arbitration committee; the rules for loading long materials; and the text and sheets relating to standards and recommended practice. All these are now printed separately, and it is not only an additional expense, but an inconvenience, to include them all in the annual volume of the proceedings. As the subject may be submitted to letter ballot, it is important that it be presented in shape which will permit of some improvement as regards the objectionable features we have mentioned. The slight discussion on this part of the report disclosed a desire of one member to make no changes but continue printing the bulky volume, which grows larger each year. Another member desired that at least the rules of interchange be included. One alternative would be to print the proceedings proper in one volume, and the rules and standards above mentioned in another volume for the same year. The aim should be to make the volume of proceedings a record of perma-

nent matters, and to eliminate the code of interchange rules and decisions of the arbitration committee, which are of transient interest. The standards and recommended practice should form a separate volume.

THE cast iron wheel certainly came pretty near getting a hard rub yesterday morning from President Curtis. It might almost sympathize with the fellow who said: "You've knocked me down and spit in my face, and if you do it again I'll begin to think that you are trying to insult me." The very moderate statement that many railway officials were beginning to think that a steel wheel was the only one to put under a high capacity car was but half expressing the growing sentiment in favor of that type of wheel. For naturally the question is asked, If it is so good for 50-ton cars why not put it under those of 30 tons? On the other hand, there is a large number of railway men who believe in the cast iron wheel and think that it can be so improved as to be fit and safe for any class of service; but, aside from the articles that have been printed in these columns regarding the practices of wheel foundries owned by railway companies, it has been impossible to get any information as to what is being done to improve the cast iron wheel beyond the oft-repeated assurances of the wheel makers that if they are paid more they can make a better wheel. In one case, at least, a railway has accepted the challenge and bought a lot of wheels with an increased guarantee at an increased price. But as to just what was done to better the wheel in formation is lacking. So we do not know whether it was done by selected scrap or pig, by the use of titanium or vanadium, or improved foundry practice, though it is known that experiments with titanium have been in progress for some time. It is certain, however, that even among those who have been most skeptical as to the safety of the cast iron wheel under cars of high capacity there is a firm belief in the possibilities of improving it. But unless this improvement is made without much more delay, it seems probable that the steel wheel will unseat its cast iron rival in the tournament of trade and that it will be thenceforth listed among the vanquished. It has rendered such yeoman service and still has the confidence of so many men that it deserves the best and most scientific attention for its immediate improvement; or, if it has reached the summit of its metallurgical development, it is but right that the railway world should be informed of the fact, that it may act accordingly.

#### INCREASED BRAKE POWERS FOR FREIGHT TRAINS

AIR brake equipment has been improved to such an extent in the past five years that it is now possible to consider seriously a considerable increase in the brake power in proportion to the weight of the cars. The old and well established rule which provides brake power equal to 70 per cent. of the light weight of the cars is hardly sufficient to control loaded trains on grades, and for some time a number of railways in the mountain districts have increased this to 80 per cent. At the last meeting of the Air Brake Association it was proposed in one of the papers to make the brake power for freight cars equal to 35 per cent. of the total weight of the car and its loaded capacity.

For a 100,000-lb car, weighing empty 40,000 lbs., this rule would make the brake power 49,000 lbs., or about 22 per cent. more than the light weight of the car. As it has been considered necessary to proportion brake power in freight service so that it will be less than the weight of the empty car in order to prevent the sliding of the wheels, it would seem that the proposed new rule involves a radical change in existing practice and presupposes that the cars have modern air brake equipment in uniformly good order.

As this is not the general condition of the equipment in car interchange, where the old and new fixtures may be found in mixed trains, it was properly and naturally objected that such a rule could not at present have general appli-

cation. There should be, however, a constant effort toward improvements which would make such a rule applicable, and there are places where it could be applied. On many lines with heavy grade the bulk of the traffic in coal and ore is handled in cars owned by the home road, and solid trains of such cars are continually in service on the mountain grades. It is here possible and profitable to apply the modern air brake equipment and increase the proportion of brake power to that suggested by the rule above referred to.

In passenger service very fast trains are now equipped with brake apparatus which permits of the use of a brake power equal to 150 per cent. of the weight of the cars and their load without injury to the wheels by sliding, and it is only by the use of such heavy braking that it is possible to stop heavy steel cars and large locomotives in a distance which good practice regards as a safe one.

The experience gained by the use of such equipment in passenger service will in time be usefully applied to improvements in freight braking, but for the present the impression is that on account of conditions in mixed train service there is more prospect in the development of a special valve or fixture which will make it possible to materially increase the brake power on loaded cars—and reduce it when the load is discharged.

Whatever direction this movement which demands greater brake power for freight cars may take, it is necessary that more tests be made with freight trains to determine the extent to which the percentage may be safely increased. The recent interest in brake improvements and brake tests has related principally to passenger equipment, and while the elaborate tests made a few years ago with freight brakes on the Southern Pacific gave remarkable results, the brake equipment has since been improved and it would seem desirable to conduct further tests with the object of establishing and recommending new rules for freight brake power percentages.

#### HOTEL AND EXHIBIT ACCOMMODATIONS IN ATLANTIC CITY

THERE has been considerable complaint to the effect that the facilities of Atlantic City for caring for the mechanical conventions are growing inadequate. There is some apparent ground for such complaint. Many had difficulty in getting the hotel accommodations they wished, in spite of the fact that the hotel men estimate that they reserved 20 per cent. more rooms for railway and supplymen this year than ever before. No doubt enough rooms of some sort for all could have been secured in the hotels where those attending the conventions usually go, but practically all of them want rooms with baths, and there were not enough of such rooms available in the hotels referred to. Furthermore, the space available for exhibits on the pier was insufficient. The secretary of the Railway Supply Manufacturers' Association advises that there were received about 70 applications for booths that could not be filled; this, in spite of the fact that the track exhibit is much larger than those of previous years, and that one large exhibitor has taken space opposite the pier at the end of Arkansas avenue.

However, the situation is not nearly so bad as the foregoing facts seem to indicate. In the first place, the hotel accommodations now available might be much better utilized. Almost everybody tries to get into about a half dozen large hotels on the Boardwalk. There are others on or near it having good accommodations which for no sufficient reason do not get much of the convention business. Chalfonte always does a good business. The Chelsea, in the opposite direction from the Million Dollar Pier, is only as far from it by actual measurement, as Chalfonte, and yet there is comparatively little demand by convention visitors for rooms in it. Furthermore, plans have been made for the construction, within the next year, by the management of the Ritz-



Carlton Hotel in New York, of a large, fine hotel on the Boardwalk on the present site of the Windsor. It is expected that it will be open before next June; and if it is, it will afford large additional accommodations which, it is said, will be as good as any to be found on the Boardwalk. On the whole, therefore, it would seem that there should be no substantial ground for complaint about the hotel facilities next year, should the conventions come here and the hotel men reserve enough rooms for the convention trade.

As to space on the pier for exhibits, it can be enlarged enough to take care of them for some time to come. The Marine Hall has been used for them in the past and could be in the future. Being on the second floor of the pier, some exhibitors object to being assigned to it; but some prefer it. The latter say that while the crowds that visit it are not large, those very numerous railway men who come here with the serious purpose of learning all they can about old devices that have been improved and new ones that have been introduced, will visit all parts of the exhibit, and that simply because the crowd in the Marine Hall is apt to be small, it is a good place to show and explain to them the exhibits in a way that will get the most valuable results for both the railway men and the supplymen. Again, a new convention hall could be built farther out on the pier and the hotel men's annex extended to include the Greek Temple, thereby providing additional exhibit space the Greek Temple has become inadequate. Members of the staff of *The Daily* last week and yesterday, made careful observations of the size of the crowds, as compared with the capacity of the hall at the beginning, at about the middle and at the end of each day's session; and these were convincing that the Greek Temple is now not over 70 per cent. large enough. Every morning at the opening many people have to stand. Later in the day there is apt to be a number of empty seats, but the hall should be adapted to the maximum crowd of each day. By extending the hotel men's annex beyond the Greek Temple, and building a larger hall farther out on the pier, both the conventions and the exhibits can be satisfactorily accommodated.

It has been suggested that perhaps many of the individual exhibits should be reduced in size. It is pointed out that some manufacturers show, year after year, the same devices, until they are old and are familiar to the regular attendants at the convention, and it is said that many of these old devices might well be eliminated. It is replied to this, however, that every year a large number of young men come here for the first time, and that while many of the devices shown may be old to the older generation, they are new to the younger. Furthermore, owing to improvements, many devices that seem old are really very different from what they used to be.

The conclusion of the whole matter seems to be that Atlantic City is still capable of satisfactorily taking care of the conventions. There has been ground for some of the complaints that have been made this year; but the hotel men of Atlantic City are not solely at fault. The supply men had a chance to get increased space, and did not take advantage of it. The crowds and the exhibits both increased more in size, as compared with last year, than any one foresaw; and the shortage of accommodations was more due to this than to anything else. The Master Mechanics and Master Car Builders' Associations will continue from year to year to receive propositions to hold their meetings at other points; but nothing has yet developed which indicates that they cannot be well provided for here, or that any other place can provide for them equally well.

The Brazilian government has extended by 18 months the time specified for the completion of the Itu-Cratheus section of the Sobral Railway.

## TO-DAY'S PROGRAM.

### M. C. B. ASSOCIATION.

#### Discussion of Reports on:

Rules for Loading Materials..	9.30 A. M. to 10.00 A. M.
Prices for Labor and Materials for Steel Cars .....	10.30 A. M. to 10.45 A. M.
Coupler and Draft Equipment.	10.45 A. M. to 11.15 A. M.
Car Wheels .....	11.15 A. M. to 12.00 M.
Safety Appliances .....	12.00 M. to 12.15 P. M.
Revision of Code of Air Brake Tests .....	12.15 P. M. to 12.30 P. M.
Freight Car Trucks.....	12.30 P. M. to 1.00 P. M.
Refrigerator Cars .....	1.00 P. M. to 1.30 P. M.

### ENTERTAINMENT.

Band Concert, 10.30 A. M.—Entrance Hall, Million Dollar Pier.

Miss Beatrice Herford, 3.00 P. M.—Entertainer in Original Monologues, Brighton Casino.

Band Concert, 4.00 P. M.—Entrance Hall, Million Dollar Pier.

45th Annual Ball, 9.30 P. M.—Of the Master Car Builders' Association (Vollmer's Orchestra).

The Galena Signal Oil Company's booth will be used as a rest room for the officers and their guests.

## TRAVELING ENGINEERS' SUPPLYMEN'S MEETING.

The officers and members of the Traveling Engineers' Supplymen's Association who are here will meet at 10.30 this morning in the office of the executive committee of the Railway Supply Manufacturers' Association, adjoining the enrollment booth.

The annual convention of the Traveling Engineers' Association will be held in Chicago from August 29 to September 1, inclusive. Judging from the present outlook, it will be the largest convention of any branch of the railway mechanical department ever held in the west. Aside from the expected increase in attendance of members of the Association, the Supplymen have engaged the whole second floor of the New Hotel Sherman for exhibits of locomotive appliances. Already 30 applications for space have been received, and there is no doubt but what the entire 8,000 ft. available will be occupied.

The officers and members of the executive committee of the Traveling Engineers' Supplymen's Association are: President, Charles B. Moore, American Arch Company; secretary, J. Will Johnson, Pyle-National Electric Headlight Company; treasurer, F. W. Edwards, Ohio Injector Company; F. D. Fenn, Crane Company; W. L. Allison, Franklin Railway Supply Company; Charles Shults, Worth Brothers Company; F. A. Morrison, Mason Regulator Company; B. J. Neely, Jenkins Brothers, and W. O. Thompson, secretary, Traveling Engineers' Association.

### M. C. B. BALL TO-NIGHT.

The forty-fifth annual ball of the Master Car Builders' Association will be given on the Million Dollar Pier to-night at 9.30 o'clock. Headquarters for the officers of the Association will be at the booth of the Galena Signal Oil Company, at the east (ocean) end of the ball room. The grand march will be led by President and Mrs. Curtis, and the other officers of the Association and their ladies, and will be personally conducted by J. Will Johnson, chairman of the entertainment committee. Vollmer's orchestra will furnish the music, and punch and refreshments will be served at both ends of the ball room.

## Proceedings.

The first session of the forty-fifth annual meeting of the Master Car Builders' Association was held in the Greek Temple, on Young's Million Dollar Pier, Atlantic City, N. J., on Monday, June 19, 1911.

The president, T. H. Curtis (L. & N.), called the meeting to order at 9.30 o'clock and invited the past presidents and members of the executive committee of the Master Car Builders' and Master Mechanics' Associations to take seats on the platform. The Rev. Dr. Newton W. Cadwell invoked the Divine blessing. Mayor Stoy, of Atlantic City, for some reason was prevented from welcoming the Association this morning.

The President: We have with us this morning the oldest



T. H. Curtis,  
President, M. C. B. Association.

ex-president of the Association, Mr. Wm. McWood, and I will ask him to say a few words to us.

Wm. McWood: I thank you for your very kind remarks, but I must candidly confess that I am a much better car builder than speaker. I thank you all for your kind greeting. (Applause.)

### ADDRESS OF PRESIDENT CURTIS.

We are here assembled for the forty-fifth annual convention of the Master Car Builders' Association and, as its president, I take great pleasure in welcoming you. It is very gratifying to observe that the ladies have favored us with so large an attendance. Your presence is always beneficial and your smiling countenances are encouraging and inspiring. Surely no place affords more pleasure or diversion than Atlantic City, and we trust that your short stay here may be enjoyed to the fullest and that you will leave with the desire to meet with us another year. It is very pleasing to observe that so many of the members of the Association are present. Some have attended these meetings at various places for

many years and have watched the growth and progress of the Association, while others are here on their initial visit. Be it far from any member to feel that his mission here is limited to what may be heard or said within these four walls. The time has passed when the progressive railroad officer may live entirely to himself—he must associate himself with his fellow-men and they, through their combined knowledge and strength, devise effective ways and means for the proper conduct of various departments. The Association's printed and bound record of proceedings contain a complete record of the reports of the various committees and the discussions that follow, and in them is recorded the progress that we make from year to year, and they may be considered annual markers indicating our progress in time as a milepost indicates the distance traveled.

The supplymen, who are truly captains of industry, are to be congratulated upon their fine display and their ever-pleasing manner in exhibiting the appliances which they rep-



A. Stewart.  
First Vice-President, M. C. B. Association.

resent. On this great pier and for some distance in one of the streets in this vicinity are to be found on exhibition, railway equipment, appliances and supplies so extensive that if only a few moments' time were given to each important subject, it would require over a day to investigate. The opportunity to inspect these extensive exhibits should be considered a great privilege, as much knowledge for the betterment of railroad service may be gained therefrom.

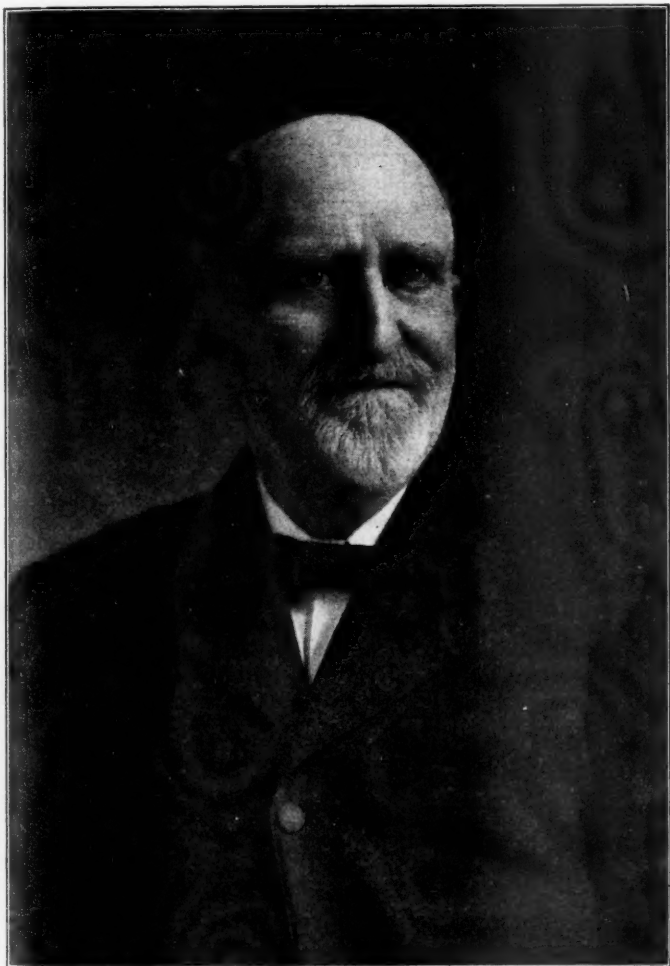
**Safety Appliances.**—The past year has been a very eventful one in the history of this Association and we have before us for immediate consideration several very important subjects. The twenty-fourth annual report of the Interstate Commerce Commission contains a report of the chief inspector, J. W. Watson, in the summary of which it is shown that in the year ended June 30, 1910, nearly a half-million freight cars were inspected and a little over 5 per cent. were found to be defective. When comparing these figures with those for the year ended June 30, 1905, in which about one-fourth of a million freight cars were inspected and over 22 per cent. were found to be defective, we have the comfort of knowing



that an improvement was made, but there is still room for further effort. The comparative classified table of defective safety appliances on freight cars, for the year ended June 30, 1910, as to couplers and uncoupling devices, shows over 5,000 defective appliances. Over 1,500 of these defects were in the uncoupling chains. These could have been practically obviated by the use of a first-class chain that would not have cost over 15 cents. Over 2,000 more of the defects reported could have been righted within an average of one-half hour's time for each defect, and at a cost of not over 50 cents each. Over 6,000 cases of defects were reported in hand-holds, ladders and sill-steps. Of this number, over 600 were for missing sill-steps and nearly 4,000 for missing hand-holds. These omissions are to be deeply regretted. As to air brakes, over 16,000 cases were reported, of which over 6,000 were for brakes cut-out and over 2,000 for cylinder and triple valves not having been cleaned within the prescribed time. There were over 2,000 cases of release rods

composed of members of our Association, the American Railway Association and others, and it is to be hoped that every effort will be put forth on the part of the members of this Association to familiarize themselves with these standards with a view to properly applying and maintaining them. And, furthermore, I urge you to co-operate with the Interstate Commerce Commission representatives, and by this co-operation the object of the law will be attained and uniformity will be the result, as well as good feeling between all concerned. One result of the enforcement of the safety appliance law will be the bringing into use of common standards for safety appliances for all classes of rolling stock equipment, regardless of the ownership of the equipment, whether it be a railway company or a private car line.

*M. C. B. Standard Coupler.*—A common standard in railway equipment, which is being interchanged, is a necessity—it is the need of to-day. To further profit by a common standard for equipment it is earnestly recommended that the Master



J. S. Lentz.

Treasurer, M. C. B. Association.



J. W. Taylor.

Secretary, M. C. B. Association.

missing. These rods do not cost over 10 cents each.

Of the 16,000 defects cited, 10,000 of them could have been repaired by detaining the car from service only a half-day at the most, and these repairs would have required only labor and they would not have required the services of large shops and machinery. The greater portion of the defects mentioned could have been obviated by greater care and supervision, and this supervision should have come from the higher officers. They should have known that the car men were properly instructed and drilled in regard to the importance of properly applying and maintaining safety appliances.

The matter of proper application and maintenance of safety appliances is of great importance. On July 1, 1911, the United States safety appliance standards as set forth in the order of the Interstate Commerce Commission of March, 1911, will become effective. While these standards may not be looked upon favorably by some, they are the result of many conferences and hard work by a committee of inspectors for the Interstate Commerce Commission and the general committee of railways on safety appliance standards,

Car Builders' Association speedily adopt a standard M. C. B. car coupler, and that this coupler must be standard in all of its parts, and every railway to use it only. The day of experimenting with car couplers is past, the state of the art has reached its maturity. A common standard for a car coupler will reduce the great number of repair parts that are now required to be kept in stock all over these United States for repairs to the great number of different styles of the M. C. B. car coupler, which is now a standard only in its contour lines. In brief, the M. C. B. coupler of to-day is standard in service, but interchangeable only as a whole, as the various makes are widely different in details of construction. To facilitate the prompt movement of traffic and also raise the standard of efficiency and reduce the cost of operation, a standard M. C. B. coupler is a very present need. This subject of a standard car coupler was earnestly recommended by one of my worthy predecessors in his address to our Association.

*Car Wheels.*—The day for small or light capacity freight train cars, as well as passenger equipment cars, is about past.

So-called heavy or large capacity cars are now being built extensively, and some have been in operation for a long time. In some cases the strains and stresses are possibly exceeding the limits of safety for certain kinds of material that have been heretofore commonly used. As a citation I will mention car wheels. The steel car wheel is now considered by some large railway companies to be a necessity. I will not comment on the steel car wheel or on the different kinds or makes and their mission in railway equipment of to-day, but will say that the time is at hand when something should be done by this Association in prescribing and requiring that under all heavy capacity cars an efficient and suitable car wheel must be used. The common cast-iron car wheel of a grade used under light cars with good results needs to be materially increased in its strength and stability if it is to be used in service under heavy capacity cars of to-day.

**Brake Shoes.**—The increase in capacity of cars has necessarily increased the light weight of the car, and therefore made necessary the increase of the pressure on the brake shoe. For safety alone all brake shoes should have some kind of a wrought-iron or steel binding member constructed in the brake shoe to prevent the dropping of a piece of the brake shoe on the track should the shoe crack or break and a portion of the shoe fall to the roadbed. The all cast-iron brake shoe does break in pieces in service. It should be replaced by a modern up-to-date brake shoe, thereby increasing the safety of train operation, and I know it will not increase the cost of operation. This change to a modern brake shoe will effect economy and increased efficiency.

**Brake Beam Safety Hangers.**—For safety all brake beams should have efficient safety hangers, and these safety hangers or their equivalent should be required on all cars offered in interchange. The best design of brake hangers will break once in a while, and there should be a close second hanger or safety device to prevent the brake beam from falling on the track. When a brake beam falls on the track while the car is in motion the results are more or less disastrous.

**Air Brake Hose.**—Some contentions have arisen during the past two years or so regarding M. C. B. standard air brake hose, incident to the enforcement of the rule requiring the use of standard  $1\frac{3}{8}$  in. air brake hose properly labeled. After the adoption of the specification and label, the date for complying with the standard was set forward on three different occasions and it was not until Sept. 1, 1910, that it became obligatory to have the standard hose on cars offered in interchange.

As it was not until about three years after the adoption of the specification and label as a standard that it was obligatory to equip cars with this hose, or, in other words, as three years' time had been allowed in which to properly equip cars with suitable hose, the officers of our Association did not feel that it would impose any sudden hardship upon the railways. However, it was a great surprise to many to learn, after having become better acquainted with the situation, that many of the roads had paid little or no attention to the purchase of hose as required by the Master Car Builders' Association. Some of the roads were placed to a large expense to apply the proper hose, which could have been obviated by buying the standard M. C. B. hose. Since Sept. 1, 1910, practically all cars have been equipped with the standard hose, and this subject may now be considered as closed, but it is hoped that all will learn the lesson of the necessity for complying with the Master Car Builders' standards and avoid a recurrence of unnecessary expense due to deviating from the standards, even though the deviation may be slight.

**Consolidation.**—For several years the subject of the consolidation of the M. M. and M. C. B. Associations has been under consideration. Consolidation is a subject for each member to give sincere consideration, for it may materially affect him. In detail of subjects the two associations widely differ, and yet both locomotives and cars are used in the same train, and under the same management. One would not consider a detail knowledge of the car department as fitting him for detail service in the locomotive department, or vice versa. We now have two associations to deal with two departments, which are different in detail. In the American Railway Association the railways have the consolidation of these two departments; that is, the locomotive and the car department, and this association includes many other departments. The American Railway Association is the executive head of all associations like the Master Mechanics' Association, Master Car Builders' Association and others, and therefore, it may not be wise or necessary to effect a consolidation of the M. M. and M. C. B. Association, especially as one of the associations that would form a part of

the consolidation is not executive, and the other is not executive except in a limited degree.

If these two associations are consolidated and possibly called American Railway Mechanical Association, as suggested, it will be composed largely of the men that are now members of these two associations. This would possibly be very satisfactory to the men occupying the higher position in railway service, but there would probably soon be formed two other associations, one of the subordinate heads of the locomotive department, and the other the subordinate heads of the car department, and these two associations would take up separately in detail those subjects that are close to the trade in which they are earning their livelihood, the same as the master boiler makers and master blacksmiths now consider subjects in detail that are close to their trade. This subject of consolidation needs much careful thought and consideration on your part, and all matters should be fully weighed before any definite action is taken.

In my remarks I have mentioned a few of the important subjects before us for consideration, each of which requires close application, study and care in order to derive any benefit therefrom, but, aside from the great benefit to be derived in this manner, there is also much to be gained by encouraging the social side of this occasion. There are many points of interest in this vicinity, with enough diversion that all may find a source of pleasure and recreation. Also, the entertainment committee has provided for us a most extensive and delightful program. This committee has spared no care or effort in looking after every detail. We are also indebted to the hotel men and to the city officials for having extended to us so many favors looking toward our comfort. It is said that "All work and no play makes Jack a dull boy." Therefore, do not let us work all the time. May we get into closer touch with our fellow-men by attending the social events, and, when the convention is adjourned, go home recuperated both in mind and in body and be better fitted for our daily duties.

#### ASSOCIATION BUSINESS.

Secretary Taylor then presented his report which showed that the active membership in June, 1910 was 377. Since that time there have been transferred to representative membership 9, dropped out of railway service 3, resigned 2, deaths 3, transferred to life membership 1, 18 in all, leaving a balance of 359. There have also been transferred from representative membership to active membership 4, new membership 59, total 63, making the active membership June, 1911, 422. The representative membership in June, 1910, was 332, dropped on account of absorption of roads 3, dropped on account of successor appointed 25, dropped on account of being out of railway service 3, dead 4, 35 in all, leaving a balance of 297. There have also been transferred from active membership 9, new representatives, new roads 19, new representatives from old roads 36, total 64, making the representative membership June, 1911, 361. The associate membership remains at 13. The life membership in June, 1910, was 22. During the year four life members have died and one has been elected, making the present membership 19. The total membership in June, 1911, is 815.

The number of cars represented in the association compared with 1910 is as follows: June, 1910, 2,298,633; June, 1911, 2,464,530, an increase of 165,897. During the year 23 roads and private car lines have signified their desire to become subscribers to the rules of interchange governing freight cars, and one road has advised of its acceptance of the code of rules governing the interchange of passenger equipment.

The report of the Treasurer showed that the receipts during the year had been \$17,220.76, and the expenses had been \$17,213.37, leaving a balance of \$7.39. The amount of unpaid dues is \$992, and a list of the delinquent members is attached to the report of the Secretary. The association has a surplus fund of \$1,126.20.

The report of the Secretary and Treasurer was referred to an auditing committee made up of T. H. Goodnow (L. S. & M. S.), J. W. Fogg (B. & O. C. T.) and C. D. Young (Penn.).

The president named as members of the obituary committee the following: For J. E. Cowan (D. & H.), J. H. Manning; for G. P. Sweeley (Penna.), W. C. Arp; for J. J. Connelly, Wm. Garstang; for F. O. Bray (L. S. & M. S.), D. R. MacBain; for A. C. Robson (Ill. Cent.), F. W. Brazier; for J. E. Dorn (B. & A.), R. D. Smith; and for Jas. Denver (N. Y. N. H. & H.), G. W. Wildin.

The annual dues were fixed at \$4 per vote, the same as heretofore.

The president named as the committee on correspondence and resolutions Messrs. T. H. Goodnow, J. F. Walsh and J. F. Enright.

Prof. Edward C. Schmidt, of the University of Illinois, has



made application for associate membership, which under the Constitution will lay over until the next annual convention.

J. W. Marden (B. & M.) and J. W. Flemming (C. & O.) have been proposed for life membership.

F. W. Brazier (N. Y. C.): It is a well-known fact that many members decline to serve on committees, stating as the fact that they cannot devote the time to the work; and I regret to say that there are many officials of railways that do not seem to be willing to let members devote time or any little expense to committee work. At the same time, these same officials and railway companies derive benefit from the work that is done by others. The past year has been one of the busiest years for the officers of this association in its history. You are all aware of the safety appliance law which went into effect this year, and most of you know that there was a general committee appointed, who visited Washington and worked with the Government representatives. Finally, at a hearing before the Interstate Commerce Commission, they very wisely referred the matter back to a conference committee, consisting of five railway members, five of the Government inspectors and representatives of the labor organizations. This conference committee spent almost a month's time in going over the safety appliance law with the other representatives, and were able to arrange modifications mutually satisfactory to all the parties in interest, which will save the railways of this country a few million dollars without impairing, even in the slightest way, the efficiency of the safety device. The meetings were conducted so harmoniously that when the final hearing came before the Interstate Commerce Commission every point that was raised was agreed to, an extension of time was given on the old equipment, and concessions that were made on the present equipment were such that all the railways of this country and private lines as well will reap the benefit of their labors.

This association is indebted to its president, Theodore Curtis; Mr. Gibbs, of the Penna. R. R.; Mr. Fuller, of the Union Pacific; Mr. Seley, of the Rock Island Lines, and Mr. Beems, of the N. Y. Central Lines, for the faithful manner in which they attended to their duties and for the good feelings which they brought about with the Government inspectors. It should bring the blush of shame to any railroad official or any member of this association who dares say that they do not have time to attend to the duties of committee work that has been done by the committee I have mentioned and others that were on the general committee.

This association has been more or less criticised for having standards and recommended practices which have not been followed. No doubt the individual members of the association have not been to blame for this; some officials have purposely ignored them and, gentlemen, we are paying dearly for it at the present time, because had the M. C. B. Rules and Recommended Practices been followed out more closely the present drastic laws would never have been passed; consequently to show the feeling that this association has towards this committee, that has done this hard work, I move that we extend to them our sincere thanks for their laborious duties and the very pleasant way in which they represented this association and brought about the good feeling between the Government officials and the railways.

The motion was unanimously carried by a rising vote.

H. H. Vaughan (C. P.): I wish to make a request that this association establish a standard or limiting the height for the running board of a standard dimension box car. I will put it in the form of a motion and move that the matter be referred to the committee on standards for its consideration. The standards of this association prescribe a height for the eaves of a box car with standard inside dimensions, but do not prescribe any standard height for the running board. The matter has been brought before the Canadian Railway Commission in connection with bridge and tunnel clearance, and, at the meeting at which it was presented to them, the question arose that this association had never established any standard height for the running board of box cars. I understand that the matter is to a certain extent already in the hands of the American Railway Association, but at the same time I see no objection to the committee on standards corresponding with that association and ascertaining if it would be satisfactory to them for us to take this matter up.

R. L. Kleine (Penna.): We now have a specified height for brake shaft—that is, 14 ft. 2 in., if I am not mistaken—and the safety appliance law requires 14-in. clearance underneath the brake wheel, and that would practically make the maximum height of the running board 13 ft. 10 in. according to present standards.

Mr. Vaughan: There is practically no difficulty, and I think I am correct in saying that almost no cars today exceed a height of 13 ft. 6 in., and the difference between that and 13

ft. 10 in. is worth having, as a matter of saving, if we can get it.

C. A. Schroyer (C. & N. W.): I think it is unnecessary that a committee should be appointed on that subject, because we are limited in the height of our cars by the brake wheel. We must have a clearance between the brake wheel and top of the running board, and we can go to within these limits, so that a committee appointed on that subject would not be able to accomplish anything more than is now accomplished by the limits prescribed.

C. A. Seley (C. R. I. & P.): I think what Mr. Vaughan seeks is merely a statement in the standards of the height, no matter how derived. I think that is within the province of the committee on standards to take that up and include it in their report.

Mr. Kleine: Do I understand, Mr. Vaughan, that it is the maximum height of running board that you want fixed, or is it a uniform height?

Mr. Vaughan: I think we should fix a maximum height in the standards. The height of the brake wheel does not affect this. It is the height of a man standing on the running board that we are after. In Canada there is a movement to fix the height of bridges at 22 ft. and we think they should be 20 ft., as we assume that we are not going to have brakemen who will be over 6 ft. 6 in. tall, standing on a running board 13 ft. 6 in. in height, so that everything we can get out of that is in value in grade crossing work if they are going to insist on clearances enough for a man to stand on top of an ordinary car.

G. W. Wildin (N. Y. N. H. & H.): I believe there should be some limit in the matter of cleaning the triple valves of air brakes. I do not believe, if a road properly cleans the triple valves, that they should be required to pay for another cleaning done within 15 days of the original cleaning. As it stands now, you have got to pay the bills if the arbitration committee says so. I think there should be some reasonable time set as a limit in this matter, and that an owner shall not be required to pay for a second cleaning of the triple valves until after the expiration of a stated period.

Mr. Seley: I do not know whether it is the proper time to bring this matter up, but I will give notice that it is my intention, if it is proper to do it at that time, to introduce in the discussion of the coupler committee report the question of the abrogation of the standard of the association as regard the top lock. I have always considered that this association made a mistake in standardizing the top lock coupler. That has been emphasized this morning in the president's address, quoting from the action of the Interstate Commerce Commission; and whether it is proper to take it up now or in connection with the report of the committee, I cannot say, but I would like to give notice of my intention to make a motion at the proper time to reconsider that matter as a standard.

The President: Mr. Wildin, did you make a motion about the triple valves?

Mr. Wildin: My motion is that the matter of cleaning the triple valve be referred to the Committee on Interchange, so that there will be a minimum limited time in which the owner will be required to pay for cleaning the triple valve.

Mr. Schroyer: I think that is unnecessary, unless we want to change the present limit. If a triple valve has not been cleaned inside of a year, a foreign line can clean it and charge the owners. Unless you want to reduce that time I think the motion is unnecessary.

Mr. Wildin: Mr. Schroyer does not understand what I am getting at. For instance:—You clean a triple valve today, and we pay you for it. In 30 days the car goes over to the C. M. & St. P. and they clean it, and we will have to pay for it. I have had something like 50 cases in the last year, and when I have referred the matter to the arbitration committee, to see where the matter stood, they have said, "You will have to pay the bill." There seems to be no limit now.

T. L. Burton (C. of N. J.): I think this question that Mr. Wildin brings up probably originates from an improper cleaning rather than to a too frequent cleaning of the triple valve. The rule states specifically that the work can be done and charged to the car owner once a year or when the brake is inoperative. I have found, as I have no doubt Mr. Wildin has found, that this work is sometimes done improperly, and then when the car reaches the Milwaukee Road to which he refers, the brake is inoperative and it is up to the road to put it in order. It is also true, unfortunately, that when that work is done the cars are not always stenciled when the valve is opened up and cleaned. I think it is a question of improper cleaning, rather than too frequent cleaning.

Mr. Wildin: I think the road which makes the improper

repairs or cleaning should not be paid for the work, and if it is necessary to clean the valve again within 30 days, the road which cleans the valve the last time should be paid, and the road which cleaned it the first time should not be paid. I know it is a matter of improper cleaning and that is where the whole trouble arises; for if the triple valves were properly cleaned they would not require cleaning again so soon.

W. F. Bentley (B. & O.): I want to endorse largely what Mr. Burton says. I think a very great deal of the work is done improperly, not by reason of improper cleaning, but by reason of the people cleaning the triple valves out in the yard at the cars, without putting the valves on the testing rack to know whether they are properly cleaned or not. By a careful checking of a large number of triple valves on the test rack—the improved test rack of the Westinghouse Company—it will be found that about 35 per cent. of the valves, after cleaning, will not stand the test, and yet if these valves are not properly tested they are put on the cars just the same. If you put the triple valves on the cars out in the yard, the inspectors and others who might do the cleaning will not be able to detect whether the valves are properly cleaned or not by any tests which they will be able to make in the yard. If the triples were tested on the test rack very different results would follow. This is a matter which should be given careful consideration.

T. H. Goodnow (L. S. & M. S.): I believe, in line with Mr. Wildin's remarks, that if the committee which handles this subject will embody in its report a requirement that the name of the road making the repairs to the triple valve, as well as the date, shall be stenciled on the hose, it will go a long way to checking this matter, without complicating the work, and then those who do the work the second time will have the information to give the car owner when a question of this kind comes up. At the present time it is almost impossible to locate the road which did the improper work. By having the additional stencil, showing the initials of the road which did the work the first time, it will protect the car owner from the effects of this improper work. I would like to have that included in the consideration of the question.

Wm Garstang (C. C. C. & St. L.): We have a committee on train brake and signal equipment, and I would move that the question of the cleaning of triple valves, as brought out in this discussion, be referred to this committee for consideration and recommendation.

The President: Mr. Wildin, do you accept that?

Mr. Wildin: I will accept anything to get the matter before the convention.

The President: Gentlemen, you have heard the motion made by Mr. Wildin to refer this subject to the committee on train brake and signal equipment. (The motion was carried.)

C. A. Seley: Do I understand what I had to say will be taken up when the report of the committee on coupler and draft equipment is considered?

The President: Yes.

The committee on nominations made the following nominations: For president, A. Stewart, G. S. M. P., Southern; C. E. Fuller, Asst. Gen. Mgr., Union Pacific, and D. F. Crawford, G. S. M. P., Penna. Lines West, Pittsburgh. For vice-president, A. Stewart, G. S. M. P., Southern; C. E. Fuller, Asst. Gen. Mgr. Union Pacific; D. F. Crawford, G. S. M. P., Penna. Lines West, Pittsburgh; M. K. Barnum, G. S. M. P., Illinois Central; R. E. Smith, G. S. M. P., Atlantic Coast Line, and D. R. MacBain, S. M. P., L. S. & M. S.

#### REVISION OF STANDARDS AND RECOMMENDED PRACTICE.

1. After due consideration of present standards and recommended practice of the Association, together with replies from members to the circular of inquiry and requests involving standards presented by the Secretary, the committee reports as follows:

##### STANDARDS.

##### *Journal Boxes and Details*

Pages 694 to 696, Sheets M. C. B. 1 to 13.

2. A member suggests that the sections for journal bearings, Sheets M. C. B. 1, 3 4, 6, 7, 9, 10, 12 and 13, should show the section of the side guide at the center for journal bearings, arranged similar to each other instead of being lighted from above on some and from below on others. The committee while appreciating that this would make all the journal bearings uniform, at the present time the 3¾-in. by 7-in. and 4¼-in. by 8-in. journal bearings are lightened from below and the 5-in. by 9-in. and 5½-in. by 10-in. journal bearings are lightened from above, and as this in no way affects the journal bearing it is thought that the expense incurred in changing patterns, drawings and standards is not warranted.

##### *Journal Boxes and Details. For Journals 5 by 9 by 5½ by 10 Inches.*

Sheets M. C. B. 8 and 11.

3. A member suggests that the opening in the rear wall of 5-in. by 9-in. and 5½-in. by 10-in. journal boxes be reduced so as to give some protection for the dust guard, and submits sketch showing the openings recommended.

The committee does not approve of this suggestion, as these walls have but recently been enlarged by a vote of the Association in order to prevent the walls of the boxes being broken out.

##### *Journal Box and Details. For Journals 5½ in. by 10 in.*

Page 696, Sheet M. C. B. 11.

4. A member suggests the following: Journal boxes for the heavier capacity equipment are being made of pressed and cast steel, and in order that the standards may be up to date, the following changes in the notes on Sheet 11 are recommended:

Section of box may be made either circular or square below the center line and material may be cast iron, malleable iron, pressed steel or cast steel; provided all the essential dimensions are adhered to. When journal box is made of material other than cast iron, reduction in thickness of metal and coring to lighten weight is permissible, provided all the essential dimensions, which affect interchangeability and the proper fitting of contained parts are adhered to. If the method of manufacture does not permit of placing the letters "M. C. B." on the side



R. L. Kleine.

*Chairman, Committee on Revision of Standards and Recommended Practice.*

of the journal box they may be placed on the top between the hinge lug and seat of truck sides.

The committee suggests that they be referred to letter ballot.

##### *Axles.*

Sheet M. C. B. 15.

7. A member writes as follows: "We have under consideration, at the present time, the question of marking some cars 115,000 lbs. capacity, and using under them 5½-in. by 10 in. axles. We know that under Markings for Tank Cars it is allowable to mark the maximum weight of the car, including the car and lading, 161,000 lbs., and will use an axle with a minimum journal 5 in. in diameter. We are already marking some cars 115,000 lbs. capacity having 5½ in. by 100-in. journals, which car will weigh, when light about 44,000 lbs., making total weight of car and lading about 159,000 lbs., but these car bodies, which are used in coal service, can hardly be loaded in excess, while the coke cars we now have under consideration could very readily be loaded in excess with coal.

"We would like to know if we would be safe in marking these new coke cars 115,000 lbs. capacity, or whether we should mark on them the maximum weight of the car and lading, and if we presume upon taking these axles out when the diameter reached about 5¼ in., what would be the maximum weight that we could mark them and still have them pass the interchange points without any trouble?"

Your committee would call attention to Rule 86 of the



Code of Rules Governing the Interchange of Cars, which provides two methods of marking cars to indicate the load limit on axles. In both of these tables the limits for the  $5\frac{1}{2}$  in. by 10 in. axle under the heading of Capacity Car and Maximum Weight are precisely the same, but these limits are varied for the smaller axles. The various railways, as far as can be learned, have not followed the marking of maximum weight, excepting for tank cars, but adhered to capacity marking, usually allowing ten per cent. overload. The published tariff rates which cover minimum carload weights refer to cars of various capacities, and if the cars were to be marked maximum weight some objections might be raised by the traffic people, furthermore, the present prevalent method of marking capacities has been in use a great many years and is thoroughly comprehended and understood by the various departments of all railways throughout the country, and any change at this time would have a tendency to lead to confusion, auditing systems would have to be revised and changed and likewise the stenciling on the majority of the cars in the country. Notwithstanding this, cars should be permitted to be loaded to the carrying capacity of the axles, and it is a question as to how this can be accomplished without seriously affecting both the traffic and motive-power departments.

The committee is not in favor of having more than one limit for the minimum diameter to which the journal and wheel seat may be worn, as this would lead to too much confusion in the shops. It is thought that without increasing the present number of axles and without changing the minimum diameters of journal and wheel seat, the present table of capacity markings for cars could be so amended as to permit variations in the capacity markings of the cars (minimum variations 5,000 or 10,000 lbs.) by adding to the table the maximum load for which the representative axles were designed, and by deducting from this maximum load the light weight of the car and the overload of ten per cent., which would give the correct capacity to be stenciled on the cars. For the consideration of the members before any definite action is taken.

#### *Limit Gages for Inspecting Secondhand Wheels for Remounting.*

Page 702, Sheet M. C. B. 16-A.

8. A member suggests the following: "Referring to discussion at M. C. B. meeting relative to advancing from Recommended Practice to Standard, gage for accepting secondhand wheels, would advise that on referring to page 637, M. C. B. Proceedings 1909, it will be noted these gages were proposed in 1907 and since then have not been changed in contour, the condemning height of both gages being 1 5-16 in. With the old  $1\frac{1}{8}$ -in. flange, this represents a wear of only 3-16 in. in the original chill, but with the present 1-in flange this represents a 5-16-in. wear into chill. Specifications for M. C. B. wheels state that the chill at the throat shall be in no case more than 1 in., nor less than  $\frac{3}{8}$ , 7-16 and  $\frac{1}{2}$  in., respectively, on the 625, 675 and 725-lb. wheels. Taking the minimum chill, therefore, as  $\frac{3}{8}$  in. on light wheels with an encroachment of 5-16-in. wear before condemning would leave only 1-16-in. chill on this wheel when the wheel is remounted secondhand. In the same way the 675-lb. wheel would have  $\frac{1}{8}$ -in. chill remaining and the 725-lb. wheel would have 3-16-in. remaining.

"It would seem to us that the committee had overlooked the point that the flange had been reduced  $\frac{1}{8}$  in. in height."

The chairman of the wheel committee advises that the change should be made as suggested.

The committee, therefore, recommends:

A. That the note under limit gage shown on Sheet M. C. B. 16-A be changed to read: "For remounting cast-iron wheels cast prior to the M. C. B. standard tread and flange adopted prior to 1909."

B. That drawings be added showing the limit gage for cast-iron wheels with M. C. B. tread and flange adopted in 1909, reducing the limit for height of flange from 1 5-16 in. to 1 3-16 in., and a note added under these gages reading as follows: "For remounting cast-iron wheels with M. C. B. standard tread and flange adopted in 1909."

#### *Air Brakes—General Arrangement and Details.*

Pages 706 to 708, Sheet M. C. B. 18.

11. A member suggests that to conform to U. S. Safety Appliance Standards the paragraph referring to hand-brake chain should be changed.

The committee approves this recommendation.

12. A member suggests that the double hand-brake arrangements shown on Sheet M. C. B. 18 do not conform to

requirements of the Interstate Commerce Commission, and should be made to work with the air.

The committee referred this matter to the committee on train brake and signal equipment for the necessary attention.

#### *Air Brakes—General Arrangements and Details.*

Pages 706 to 708, Sheet M. C. B. 18.

14. A member suggests that the distance from the inside face of M. C. B. coupler knuckle to the center of air-brake angle cock shown on Sheet M. C. B. 18 should be changed from 13 in. to 11 in. to agree with the Air Brake Association recommendation.

The committee does not approve.

#### *Air Brakes—General Arrangements and Details.*

Pages 706 to 708, Sheet M. C. B. 18.

15. A member calls attention to the following: Relative to brake-lever connection, Sheet M. C. B. 18, this cut shows the connection to be round iron or steel not less than  $1\frac{1}{8}$ -in. diameter. This is the only reference I know of in regard to the material and construction, and I feel sure that it is but little understood by railway men in general. Some railways are making this connection of cast steel in the star section in the center the same as is used in malleable iron. If this connection is to be seriously considered as an M. C. B. Standard it should be plainly brought out.

Committee would call attention to text on page 708, reading as follows: "In 1900 the use of malleable iron construction was discontinued providing that the truck connection be made of round iron or steel not less than  $1\frac{1}{8}$ -in. in diameter." This would indicate that the rods were to be made of  $1\frac{1}{8}$ -in. wrought material, although cast steel is not prohibited.

The committee believes that cast steel of proper section is suitable for truck-lever connection and would suggest that a note be added to Sheet M. C. B. 18 reading as follows: "Cast steel may be used for truck-lever connection if of equal strength to the section of wrought iron or steel specified."

#### *Label for Air-brake Hose.*

Pages 712 and 713, Sheet M. C. B. 18.

16. A member suggests the following: Page 709, seventh paragraph, the size of hose and the letters A and R as well as numerals indicating month hose was applied or removed are not covered in the specifications. To cover the size of hose and after the word "purchaser" in third line the words, "and the size of the hose  $1\frac{3}{8}$  in."; and to cover the date applied and removed add after "standard" in fifth line the words, "also in the center field the letters A and R to the left and the numerals as shown to the right."

This information should also be shown in paragraph referring to badge plate under specifications and test for woven and combination woven and wrapped air-brake hose.

Show size of hose on label as per sketch submitted instead of as shown on pages 709 and 712, Sheet M. C. B. 18.

The text under heading "Label for Air-brake Hose," page 712, should also include the size  $1\frac{3}{8}$  in. and M. C. B. Standard as shown on Sheet M. C. B. 18.

The committee recommends that the label and text (paragraph 7, page 709) referring to same be omitted from the specifications for air-brake hose and placed under the label for air-brake hose, paragraph 7, to be changed to read as follows: "Each length of hose must have vulcanized to it the label for air-brake hose of white or red rubber as shown under the specifications, Label for Air-brake Hose. Each lot of 200 or less must bear the manufacturer's serial number commencing at one on the first of the year, and continuing consecutively until the end of the year. For each lot of 200, one extra hose must be furnished free of cost.

17. Change second paragraph on page 711 under the heading of "Specifications and Tests for Woven and Combination Woven and Wrapped Air Brake Hose" to read: "Each length of hose must have vulcanized to it the label for air-brake hose of white or red rubber as shown under the specifications 'Label for Air Brake Hose.'"

18. Change second paragraph under the heading "Label for Air-brake Hose," page 712, to read: "Each length of hose must have vulcanized to it a standard air-brake hose label of white or red rubber as shown. The following information must be branded on the label: On the top of the badge the initials or name of road or purchaser and the size  $1\frac{3}{8}$  in.; on the bottom the name of manufacturer; on the left-hand end the month and year of manufacture; on the right-hand end the serial number and the letters M. C. B. Standard; and in the center field the years, letters A and R, and the numerals for the month to show the date of application and removal. These letters and figures must be clear and distinct, not less than  $\frac{1}{4}$  in. in height, excepting

name of manufacturer, which must not be less than  $\frac{1}{8}$  in. in height, and stand in relief not less than 1-32 in. Letters and figures covering the application and removal of the hose must be so applied that they can be removed by cutting without endangering the cover."

Dimensions of label to be 4 in. by  $2\frac{1}{2}$  in. Extensions may be made on right-hand end.

No change has been made in the air-brake hose label aside from increasing the size of letters and numerals from 3-16 in. to  $\frac{1}{4}$  in. in height, and name of manufacturer, which has been specified to be not less than  $\frac{1}{8}$  in. in height. The text has been revised to correspond with label.

20. A member suggests that we should add a paragraph to the specifications, Label for Air-Brake Hose, page 713, to cover fitting up hose to the couplings and nipples so that the label on the hose will show toward the side of the car in such a position that the car inspectors can readily read the label from the side of the car.

The committee concurs in this suggestion and refers it to letter ballot for adoption as Recommended Practice.

#### *Safety Appliances.*

Pages 715 to 722, Sheets M. C. B. 19 to 19-B.

24. A member suggests to adopt Recommended Practice for brake details shown on Interstate Commerce Commission Plate "A" as follows: "Brake wheels both flat and dished 15 in. and 16 in. diameter, brake ratchet wheel, brake ratchet-wheel pawl and brake ratchet-wheel pawl plates."

25. A number of members suggest that the text and sheets be revised to conform to Interstate Commerce Commission requirements.

The committee approves these recommendations and suggests that the U. S. Safety Appliance Standards adopted March 13, 1911, by order of the Interstate Commerce Commission be substituted for the present Standards.

#### *Arch Bars for 100,000-lb. Capacity Cars.*

Page 723, Sheet M. C. B. 20.

26. The  $1\frac{1}{2}$  in. by 5 in. arch bar for 100,000-lb. capacity truck, which was adopted as a Standard in 1909, is giving trouble, due to failing through the bottom column bolt hole. The  $1\frac{1}{4}$  in. by 6 in. arch bar used by some roads for the 100,000-lb. capacity truck is reported as giving good service. As it would appear that the present standard is unsatisfactory, the committee would recommend that this question be referred to the Committee on Freight Car Trucks, with instructions to investigate what practical results have been obtained with both the  $1\frac{1}{2}$  in. by 5 in. and  $1\frac{1}{4}$  in. by 6 in. arch bars, and make recommendations for any necessary revision of the present standard.

#### *Automatic Couplers.*

Pages 724 and 725, Sheet M. C. B. 23.

27. Several members recommend the following:

During the 1910 convention it was recommended to the committee on standards and recommended practice the addition of  $8\frac{1}{2}$ -in. coupler butt, for the reason that the  $6\frac{1}{2}$ -in. coupler butt was designed to use with the  $6\frac{1}{4}$ -in. by 28-in. draft springs, allowing  $\frac{1}{4}$ -in. clearance. Again the  $9\frac{1}{8}$ -in. butt was designed to accommodate certain friction draft gears, requiring that width within the yoke. This recommendation was submitted to letter ballot and rejected, the vote being 1,191 yes and 614 no, total vote 1,805, necessary votes for adoption 1,203, or within 12 votes of carrying same. Inasmuch as there are thousands of cars equipped with the M. C. B. Class "G" springs, the  $6\frac{1}{2}$ -in. butt is not sufficient in depth, and not being good practice to use liners between the butt and yoke ends (the diameter of Class "G" spring being 8 in.), and, furthermore, this spring can not be used with the  $9\frac{1}{8}$ -in. butt as the clearance is too great, also the spring would not be central. Believe the matter should again be submitted to the M. C. B. Committee with a view of urging the adoption of the  $8\frac{1}{2}$ -in. butt as standard.

The committee does not approve of this recommendation.

#### *Height of Couplers.*

Page 737.

31. A member suggests the following: We would recommend that the paragraph reading, "The standard height of couplers for passenger equipment cars is 35 in. from top of rail when car is loaded," be modified to conform to the Safety Appliance Act of March 2, 1893, No. 113, amended April 1, 1896, which reads as follows: "Note—Prescribed Standard Height of Draw Bars; standard gage roads  $34\frac{1}{2}$  in.; narrow-gage roads 26 in.; maximum variation between loaded and empty cars 3 in.," in other words, the standard height of 35 in. specified for passenger cars should be changed to  $34\frac{1}{2}$  in.

Also, in the second paragraph we should add a clause to cover the standard height for narrow-gage cars to be 26 in., minimum 23 in., and on two-foot gage railways maximum height  $17\frac{1}{2}$  in., minimum height  $14\frac{1}{2}$  in.

The committee suggests that the text be modified to conform to the order of the Interstate Commerce Commission dated October 10, 1910, reading as follows: "The maximum height of drawbars for freight cars measured perpendicularly from the level of top of rails to the centers of drawbars for standard-gage railroads shall be  $34\frac{1}{2}$  in.; and the minimum height of drawbars for freight cars on such standard-gage railways measured in the same manner shall be  $31\frac{1}{2}$  in., and on narrow-gage railway the maximum height of drawbars for freight cars measured from the level of tops of rails to the centers of drawbars shall be 26 in., and the minimum height of drawbars for freight cars on such narrow-gage railways measured in the same manner shall be 23 in., and on 2-foot gage railways the maximum height of drawbars for freight cars measured from the level of the tops of rails to the centers of drawbars shall be  $17\frac{1}{2}$  in., and the minimum height of drawbars for freight cars on such 2-foot gage railways measured in the same manner shall be  $14\frac{1}{2}$  in.

#### *Siding, Flooring, Roofing and Lining.*

Page 738, Sheet M. C. B. 26.

33. A member calls attention to the details of siding, roofing, lining and flooring, Sheet M. C. B. 26, which shows the corners of the tongue of sheathing, roofing, lining and flooring as being square. With the tongue square, it is difficult to have the same enter the grooves, and, therefore, recommends that the drawings be changed to show the corners taken off of the tongue.

The committee approves of this suggestion.

#### *RECOMMENDED PRACTICE.*

*Journal Box and Pedestal for Passenger Cars for Journals 5-in. by 9-in.*

Page 755, Sheets M. C. B.—A and B.

The committee recommends the following:

(a) Sheet A, 5-in. by 9-in. passenger journal box, change mouth of box and dust-guard opening to conform to freight box and advance to Standard.

(b) Pedestal for 5-in. by 9-in. journal box shown on Sheet B advance to Standard.

#### *Pedestals for Passenger Cars for 5-in. by 9-in. Journals.*

Page 755, Sheet M. C. B.—B.

38. A member suggests that the passenger car pedestal for 5-in. by 9-in. journal boxes be dropped from the Recommended Practice for the reason that the flanges and other portions outside of the journal box are such that the fit would not be suitable for all the designs of truck wheel pieces.

The committee does not approve of this recommendation.

*Journal Box and Pedestal for Passenger Cars with 5 1-2-in. by 10-in. Journals.*

39. A member suggests that the Association again take up and consider the question of the preparation of drawings for journal box for passenger cars with  $5\frac{1}{2}$ -in. by 10-in. journals.

The committee recommends that this question be referred to the committee on freight car trucks, with instructions to prepare the necessary drawings of pedestal and journal box, showing only the essential dimensions.

#### *Axle "E."*

Page 760, Sheet M. C. B.—B.

42. A member suggests that the axle shown on Sheet M. C. B.—B should have the radius for fillet between the dust guard and wheel seat  $\frac{3}{4}$  in. instead of  $\frac{1}{4}$  in., so that it may be turned with the same tool as the journal and wheel seat fillets and to conform to standard axles shown on Sheet M. C. B. 15.

#### *Cast-Iron Wheels.*

Page 760, Sheet M. C. B.—N, O and P.

43. A member suggests that the recommended practice for cast-iron wheels for 60,000, 80,000 and 100,000 lbs. cars be advanced to Standard.

The committee believes that the specifications for cast-iron wheels should be advanced to Standard, but before doing so should be referred to the wheel committee for any changes or corrections that may be necessary.

#### *High-Speed Foundation Brake Gear for Passenger Service.*

Sheets M. C. B.—J, K and L.

48. A member suggests that the brake-gear arrangement shown on Sheets M. C. B.—J, K and L be revised to show



the hand-brakes independent of the air and conform to Interstate Commerce Commission requirements.

49. A member suggests that the high-speed foundation brake shown on these three sheets be dropped, as it does not conform to the Interstate Commerce Commission requirements, nor is it suitable where high-speed brakes are used, therefore this brake is not suitable for the heavy cars which are being built for passenger service, and the sheets contain no reference to such cars.

The committee recommends that these three sheets be referred to the committee on train brake and signal equipment for revision.

#### STEAM AND AIR LINE CONNECTIONS.

Pages 775 and 776, Sheet M. C. B.—Q.

50. A member calls attention to air-brake hose, Sheet M. C. B.—Q, being shown as 1 in. by 22 in. while specifications for standard hose, Proceedings 1910, page 708, paragraph 6, show that the inside diameter must not be less than  $1\frac{3}{8}$  in.

51. A member suggest that the last paragraph on page 776 be changed to read as follows: "That the air-brake hose must be  $1\frac{3}{8}$  in. inside diameter and 22 in. long, and air-signal hose must be  $1\frac{1}{8}$  in. inside diameter and 22 in. long." The recommendation to change air-brake hose from 1 in. to  $1\frac{3}{8}$  in. is made to conform to Rule 21 of the Appendix Code of Rules Governing the Interchange of Passenger Equipment Cars. The recommendation to change signal hose from 1 in. to  $1\frac{1}{8}$  in. is for the reason that, when signal hose is made on a  $1\frac{1}{8}$ -in. mandrel, the inside diameter is at least  $1\frac{1}{8}$  in. and hose should, therefore, be branded  $1\frac{1}{8}$  in."

The committee concurs in the recommendation that air-brake hose must be  $1\frac{3}{8}$  in. inside diameter, but does not approve the  $1\frac{1}{8}$ -in. diameter for air-signal hose. The committee also recommends that the heading on page 775 be changed to read: "Steam and Air Connections for Passenger Cars."

52. A member calls attention to the angle at which angle cock under car ends it set on Sheet M. C. B. 18, being 30 deg. from the vertical, while on Sheet O it is shown vertical, and recommends that 15 deg. from the vertical be made standard for freight and passenger cars.

The committee recommends that the angle cock shown on Sheet Q be changed to show 30 deg. from the vertical.

#### Uncoupling Arrangements for M. C. B. Couplers.

Sheet M. C. B.—C.

53. A member suggests that the uncoupling attachments should be changed to conform to Interstate Commerce Commission requirements.

54. A member suggests that Sheet C be revised to meet requirements of the Interstate Commerce Commission.

55. A member suggests that this be advanced to Standard in so far as all clevises and links are concerned, but not the uncoupling lever and attachments, on account of them not being applicable to all of the present equipment.

The committee recommends to advance to Standard the clevises, links and pin now shown on Sheet C, and to include Plate B and text governing the uncoupling levers of the U. S. Safety Appliance Standards, adopted by order of the Commission dated March 13, 1911, in the Standards of the Association.

#### Coupler Yokes.

Pages 776 and 777, Sheet M. C. B.—C.

56. A member suggests that the yoke for the twin spring gear, yoke for tandem spring gear and yoke for friction gear be advanced to Standard.

The committee concurs in this recommendation and suggests that they be shown on a new Sheet No. 23-A.

#### Drop-Test Machine.

Page 777, Sheet M. C. B.—I.

57. A member suggests that the drop-test machine for M. C. B. couplers and knuckle pins be advanced to Standard. The committee concurs in this recommendation.

#### Box-Car Outside—Hung Side-Door Fixtures.

Page 779, Sheet M. C. B.—F.

62. A member suggests that door-hasp staple, shown on Sheet M. C. B.—F, be increased in length from  $5\frac{3}{4}$  in. to 16 in., to provide for four bolts for fastening staple to door. The present hasp staple is causing trouble, due to pulling through the wood on account of insecure fastening.

The committee approves this suggestion.

#### Standard Location for Car-Door Seals.

65. At a special session of the General Managers' Association of the Southeast, held on September 9, 1910, the following resolution was unanimously passed:

"Resolved, That it be the sense of this meeting that car-door fastenings should be located 5 ft. above top of rail and 1 ft. above the floors of the cars, and it is recommended to all lines that they include these specifications for all new equipment, and that it be made a rule to alter the location of door fastenings for all cars going through the shops for general overhauling to conform to this standard."

It was further stated that this action will be communicated to the Master Car Builders' Association, the various General Managers' Associations and to the American Railway Association, the cause for this action being the present difficulty in procuring proper seal records, by reason of the seals on most cars being so high from the ground that those entrusted with the duty of procuring the sealing records can not read them.

This subject was considered at the meeting of the Executive Committee of the Master Car Builders' Association, on September 21, 1910, and referred to this committee. Subsequently the American Railway Association issued Circular 1069 to all railway members of that association, reading as follows:

"1. Are you in favor of adopting a standard height for car-door fastenings?"

"2. Do you favor 5 ft. or 6 ft., or what other height above the rail as the height for car-door fastenings?"

"3. If a standard height is adopted, shall it apply to equipment going through shops for general repairs as well as to new equipment?"

"4. In your opinion, would an additional fastening be required on the door in the event of the present fastening being lowered to a point near the bottom edge of the door as proposed?"

The committee has given this matter very careful consideration, and would call the attention of the members to Sheet M. C. B.—F, Box Car Outside Hung Side Door, on which the hasp to which the seal is attached is located about 5 ft. 6 in. from the top of rail, and to sheet M. C. B.—F-1, Box Car Flush Side Door, on which the hasp to which the seal is attached is located "5 ft. 6 in. from top of rail." Flush doors of the description shown on Sheet F-1 are sealed both at door-rod handle and at the hasp, therefore, the sealing dimension should be shown at the door-rod handle as well as at the hasp. On some refrigerator cars, on account of the double-door bar-lock construction, it is difficult to bring the sealing eye lower than 5 ft. 8 in. above the top of rail, and on box cars equipped with vertical door rods sufficient clearance must be allowed between the top of station platform and the handle of the door rod for proper manipulation of the door-rod handle.

It is unquestionable that the seal should be located on the doors within reasonable reading distance from the ground in order to facilitate application and inspection of the seals, and the committee would recommend the following: Center of hasp or sealing eye should be located not less than 5 ft. above top of rail nor more than 5 ft. 9 in. above top of rail. These dimensions to be shown on Sheets F and F-1 and proper reference made in text.

#### Stenciling Cars.

Page 780, Sheet M. C. B.—M.

71. A member suggests that the lettering for freight cars be advanced to Standard, as it refers only to the form and size of letters and figures.

Your committee concurs in this recommendation.

#### Limit Gages for Round Iron.

Pages 781 and 782.

72. The executive committee referred to the committee on revision of standards and recommended practice, the following: To investigate and report on whether any changes are necessary in the present recommended practice covering the diameters of round iron.

At the present time the recommended practice does not show any limits for sizes of round iron more than  $1\frac{1}{4}$  in. in diameter; furthermore, a manufacturer has asked that the limits be increased for bars  $1\frac{3}{8}$  in. and over in diameter, claiming that the present limits are rather close for rolling-mill practice, and can only be met under special conditions and with special care, which means a special price.

The committee, after carefully considering this question, believes it will be entirely proper to adopt the standards of the Master Mechanics' Association for the allowable variations, both below and above the nominal size for round iron

1½ in. and more in diameter. Revised table is given below.

Nominal Diameter of Iron, Inches.	Large Size End. Inches.	Small Size End. Inches.	Total Variation. Inches.
1½.....	1.5115	1.4885	.023
1¾.....	1.6370	1.6130	.024
1¾.....	1.7625	1.7375	.025
1¾.....	1.8880	1.8620	.026

Round iron 2 in. in diameter and over should be rolled to nominal diameter.

#### PROCEEDINGS.

78. The committee would suggest that in making up the Proceedings for the succeeding years we eliminate the result of meetings of the arbitration committee, which are published separately and the Code of Interchange Rules, also published separately, and make reference in the Proceedings similar to the reference now made for the Rules for Loading Materials, which latter have, in the past, been eliminated from the Proceedings.

The committee would further recommend that the text and sheets relating to standards and recommended practice of the association be published separately from, and not included in, the proceedings.

#### NEW SUBJECTS.

81. A member recommends the following: (a) As there is shown among the recommended practice of the Association an axle suitable for carrying 50,000 lbs., or one having 6-in. by 11-in. journals, believe that a committee should make recommendations giving information in regard to all other truck details for a truck suitable for this type of axle.

(b) As the steel truck sides for freight cars are becoming quite numerous and of various designs, suggest that specifications be prepared indicating the kind of tests such structures should stand to make them suitable for cars of 80,000, 100,000 and 150,000 lbs. capacity.

(c) Similar specifications should be prepared for truck bolsters to make them suitable for cars of 80,000, 100,000 and 150,000 lbs. capacity.

The committee concurs in the above recommendations, and suggests that the committee on freight car trucks be instructed to prepare and submit truck details to go with the 6-in. by 11-in. 50,000-lb. axle, and report upon questions B and C.

82. A member recommends that the matter of proper specifications for cast-steel, rolled-steel and forged steel wheels should be referred to the wheel committee, or some special committee, with instructions to prepare the necessary specifications and physical tests.

The committee recommends that this subject be referred to the wheel committee for consideration.

The report is signed by:—R. L. Kleine, (Penn.), chairman; W. E. Dunham, (C. & N. W.); T. H. Goodnow, (L. S. & M. S.); W. H. V. Rosing, (Mo. Pac.); C. E. Fuller, (U. P.); O. C. Cromwell, (B. & O.), and T. M. Ramsdell, (C. & O.).

R. L. Kleine (chairman of committee): Inasmuch as questions 11, 12, 24, 25, 48, 49, 53, 54, 55 and 60 refer to safety appliance standards or have some connection therewith, the committee would suggest that argument upon them be deferred until we hear from the safety appliance committee.

#### DISCUSSION ON REVISION OF STANDARDS AND RECOMMENDED PRACTICE.

F. W. Brazier (N. Y. C.): Under the head of "Proceedings," I think we will make a great mistake if we leave out of our proceedings the code of interchange rules. Those are our laws and they should go in along with the proceedings. Otherwise I am agreeable to having the result of the meetings of the arbitration committee published separately.

C. A. Seely (C. R. I. & P.): On the basis of Mr. Brazier's remarks, I would recommend the inclusion in the proceedings of all matters which are standard. When we go to our bookcase and get down the proceedings of the last year or the proceedings of five years ago or ten years ago we do not want to find that it is short of the standard that existed at that time, whether they are rules of loading material or interchange rules, or drawing; and I think if this association cannot afford to put them all up in one volume that we ought to increase the dues.

The Secretary: The rules for loading material have been kept out of the proceedings for quite a number of years. They are now a part of the interchange rules and are referred to separately in a preface.

F. W. Pratt (C. & N. W.): I would like to ask Mr. Kleine, in regard to paragraph 72, if the manufacturers' point is well taken it does not seem to me that the last paragraph covers any changes in limiting diameters on sizes below 1½ in. Was that the intention of the committee? To reduce both below and above the nominal size of the round iron 1½ in. and larger in diameter would not apparently cover the 1¾ in. that the manufacturer in this instance suggests changing.

Mr. Kleine: The manufacturer objects to the limit of 1¾ in. round iron—not the 1¾ in.

H. LaRue (C. R. I. & P.): In paragraph 65, in regard to the location of door handles, I hope the recommendation of the committee will prevail there.

The President: This is a very important subject, gentlemen, and we have plenty of time, and I hope there will be full discussion.

C. A. Schroyer (C. P. N. W.): In regard to the sealing point on side doors, we are doing on this precisely what we have done for years on our safety appliances. We have made it one place and then another, with the result that none of us has ever gotten it the same; we have never gotten together on it. Now, if there is any reason why it cannot be put at 5 ft., why, we ought to say so. If there is a certain construction of door that would permit of the 5 ft. location of the seal pin, cannot those doors be arranged when new cars are constructed so they will permit of 5 ft. or 5 ft. 6 in., whatever it may be?

Mr. Garstang (C. C. & St. L.): I understood Mr. Kleine to say that the American Railway Association had adopted a limit for the height of hasp on side doors. Now, if there is no objection to that limit by members of this association, why not adopt it as the standard of this association?

Mr. Kleine: I will read the communication from the American Railway Association, which is dated May 22, 1911:

"At a session of the association held on May 17, the following resolutions respecting a standard height for car door fastenings were adopted on the recommendation of the committee of maintenance:

"Resolved, That car door fastenings should be located normally 5 ft. above the top of the rail, but not less than 1 ft. above the floor of the car;

"Resolved, That these specification for the location of car door fastenings shall apply for all new equipment and wherever it is necessary to replace fastenings on old equipment."

The latter part of that is rather serious, when it comes to repairing cars. You keep to the standard door and you have the hasp in one location and the staple in another location. That is, if you are making extensive repairs. For new cars I do not doubt that a height of 5 ft. would be conformed to, with the possible exception of some refrigerator cars. I think Mr. Fuller has some refrigerator cars where he has a sort of double door lock, and I think 5 ft. 8 in. is as close as he would come. Take the Wagner door rods. We operate them from the freight house platform, and if the seal is located 5 ft. above the rail it is rather close to the platform, although probably some arrangement could be made there in new cars to locate it 5 ft., but with the existing cars it would be a very serious matter to change some of them.

C. E. Fuller (U. P.): It is a fact that 5 ft. is not feasible for present equipment, especially on refrigerator cars, without you change your door-opening and door-locking device entirely. It seems to me that the committee has done all that they could very well do. With the ordinary box car 5 ft. will do all right. To confine it to exactly 5 ft. is an expense that I do not believe we want to incur, especially with our present equipment. The variation of 9 in. is not sufficient to be objectionable or to warrant the additional expense that would be necessary in order to bring the old equipment up to it. I think the committee's recommendation of 5 ft. to 5 ft. 9 in. is about as close as we can ask.

J. J. Hennessey (C. M. & St. P.): It seems to me that the recommendation of the committee is about correct. We should have a variation there. With old cars it would be very expensive to attempt to get them all 5 ft. In fact, if you did that you would have no fastening for your door hasp. Really, what is the object of having this to an inch? It is simply a sealing proposition, and the seal can be seen as readily at 5 ft. 6 in. as at 5 ft. Consequently I do not think that we ought to tie the railways up to a proposition that will cost them a great deal of money in changing their old cars.

J. J. Tatum (B. & O.): I would like to ask the committee if they have made any test as to the effect in changing the lock on a door in respect to the condition of the door. That is, as to what the effect of the changing of the lock is on the condition of the door.

Mr. Kleine: A test was made by the representative of one of the Texas roads and submitted to the American Railway Association. That test showed that it did not materially affect the pull on the hasp by locating it 5 ft. above the rail. He compared it with 7 ft. above the rail, I think, and he made tests and took measurements with a spring balance. Of course, that depended largely upon the type of door that was under consideration.

W. E. Sharp (Armour Car Lines): It seems to me that the variation allowed by the committee in its report would



only be sufficient to compensate for the various heights of doors from the rail, and it will develop in another report that there is a variation. Consequently, I think if we assume a location of 5 ft. you will find that you will have quite a variation.

F. H. Clark (B. & O.): If I recall correctly the action of the American Railway Association, it was to the effect that a variation of not less than 12 in. above the floor of the car should be allowed. That would cover some variation. Have a minimum of 5 ft. and a maximum of 5 ft. 5 in. The floor of many of these cars is 50 to 53 in. So if the recommendation of the American Railway Association was followed absolutely we would have a variation there. Perhaps, however, it is not enough.

Mr. Garstang: This was brought before the American Railway Association for the convenience of conductors and trainmen. A great many of these seals are located at such a height that it was almost impossible to see them, especially at night-time, and it was the desire of the association to get the seal as near the bottom of the door as would be practicable.

C. A. Seley (C. R. I. & P.): Inasmuch as we have a practical instruction from the American Railway Association, it seems to me that we could cover both sides of the question by a slight change in the verbiage of the committee's recommendation, namely, making the height preferably 5 ft. from the rail, with allowance variation, instead of making it 5 ft. to 5 ft. and 9 in.

Mr. Kleine: The committee would accept that. I think it would be better to indicate to car builders the preferable location, and I believe it would overcome the objection that has been made. You can get all sorts of variables depending on just how the roadbed is located. While 5 ft. 9 in. is a little high, it is still within the range of vision in ordinary railway yards.

The President: Would it be agreeable to the committee to incorporate in its report Mr. Seley's suggestion?

Mr. Kleine: Yes, sir.

Mr. Schroyer: I move that the report of the committee as presented, with the modification just mentioned, be accepted and referred to letter ballot in so far as the recommendations are concerned, excepting those pertaining to safety appliances.

Mr. Kleine: That is agreeable to the committee. The recommendations referring to safety appliances are to be left open for further consideration. Also the questions that were submitted to the committee on steel train lines.

The President: Does the mover of the motion accept that amendment?

C. A. Schroyer: Yes, sir.

The motion was carried.

Mr. Seley: I would like to have an explanation as to the three items referred to the convention for disposition. They are items 7, 78 and 80.

Mr. Fuller, referring to item 7: This question is raised for the purpose of obtaining the full benefit of the load. In other words, if we have a 100,000 lbs. capacity car the weight of the car is based on the carrying capacity of the axle. We have as an illustration a 100,000 lbs. capacity car which weighs 47,000 lbs. With 10 per cent. overload that brings the load up to 157,000 lbs. Now we have another class of car of 100,000 lbs. capacity that weighs 37,000 lbs. These figures you understand I am simply giving as illustrative. This car really weighs 37,800 lbs., an all-steel box car. Now, with 100,000 lbs. capacity and the 10 per cent. overload that makes it 147,000 lbs. Under the present markings, the cars carry their capacity plus 10 per cent., and the result is that we are hauling a 100,000 lbs. capacity car with 110,000 lbs. in it and are not obtaining the full benefit of the work of light design. It is a question of marking the car so that it will not interfere with the accounting system to bring it up to the full load. There is no reason why if we can save an approximate amount of money on hauling light weights and increasing our tonnage by hauling these light weight cars that we should not receive the same benefit in hauling. In place of having 110,000 lbs. we ought to be entitled to 120,000 or 125,000 lbs. Raise the capacity of the car from 100,000 to 110,000 or 115,000 lbs., or whatever will bring it up to the carrying capacity of the axle. I think that is emphasized quite plainly by those of us who have worked on the light weights, cutting off all unnecessary weight of cars in order to avoid hauling dead weight. We want to increase the revenue if we can by hauling more tons in that car. I think this association should take some action that will be clearly understood, and not force us to go to a larger axle. The gross weight of the load and the weight of the car should govern, in place of the capacity.

The President: I would suggest that Mr. Kleine read this paragraph again and let us have it discussed more fully. We have plenty of time and we can do it now.

[Mr. Kleine read item 7 of the report.]

Geo. Gibbs (Penn.): I would ask the committee whether it gave any attention to other factors which have limiting conditions or dimensions, affecting the capacity of the cars; for instance, the kind of wheel that is used certainly has a very important bearing. We know this from our experience with coal cars. As I understand the report, the committee justify the use of the maximum weight, based on the capacity of axles alone; whereas the fact is that the wheels, especially the cast iron wheels, have proved to be a very active factor in limiting the total weight capacity of the car, to say nothing of the column bolts and springs and other parts. I suggest that it be not stated, as the sentiment of the convention, that it be good practice to mark the carrying capacity of the cars, dependent on the axles, regardless of other parts of the cars.

Mr. Fuller: In answer to Mr. Gibbs I would like to say, as an illustration, taking our 100,000 lbs. capacity cars, we are not increasing the load at all. What we want to do is to bring the capacity of the cars up to where they ought to be. We were running 100,000 lbs. capacity cars weighing 47,000 lbs., and we built a car of similar capacity weighing 37,000 lbs., with the same truck, wheels, axles and springs as under the other car, and what we would like to do is to haul 10,000 lbs. more of freight in that car. We are not putting any more labor on the trucks or wheels, and not subjecting the car to any harder service. We simply want to reap the benefit of cutting down the dead weight and in place of the dead weight to haul that much more freight in that car.

Mr. Gibbs: That is, the committee, if I understand them correctly, say that you mark the car 161,000 lbs. maximum weight, and apparently they have not given any attention to the other limiting factors. In my remarks I had no special reference to Union Pacific cars, but my comments were addressed to the committee in regard to the principle involved, in stamping a car 161,000 lbs. capacity, without taking into consideration other factors which should be considered in equipping cars for that additional weight. The time was when we could change the capacity of cars from 40,000 to 60,000 lbs. with a paint pressure load, simply changing the marking, but that time has now passed.

M. K. Barnum (Ill. Cent.): It seems to me this matter is of a good deal of importance in view of the criticism the railways have been under during the past year as to their uneconomical methods; and this is a matter which has been found to be considerably complicated, but I believe it is worthy of the careful consideration of the special committee, and if I am in order I move that it be referred to a special committee for reporting to the next meeting.

J. J. Hennessey (C. M. & St. P.): I would like to have the report cover everything about the car, from the rail to the top of the roof in a box car or stock car. The committee should check the car throughout to see that everything which they may recommend will be consistent and would overcome the objections presented by Mr. Gibbs.

Mr. Kleine: In explanation, Mr. President, of the committee's recommendation, we referred this to the convention for the very reason that Mr. Gibbs gives. It is all right as far as the axle goes, but it does not take in the other truck details. Of course, the present interchange rules do not do that on the maximum weight, which allows now 161,000 lbs. I think it is very well to refer that to a special committee.

Mr. Hennessey: In seconding Mr. Barnum's motion I want to say that I would like to see everything connected with the car, the trucks and column bolts, the whole construction as well as the car body considered—the whole construction must be taken into consideration if you increase the capacity of the cars above their present marked capacity.

Mr. Barnum's motion was carried.

Mr. Seley: In regard to paragraph 78, I move that the proceedings include the code of interchange rules, rules for loading long material, and also the standards and recommended practice, leaving out the decisions of the arbitration committee.

Mr. Fuller: I have no objections to having all of these matters included in the book—personally I think it is a very nice thing to have all of these subjects included in the book—but I want to say to you gentlemen the book is getting so large that I do not believe you will be able to use it with convenience if you keep on increasing its size. We must reduce the size of our volume. It is too large, and personally I do not see why the rules for loading long material and a few other rules should not be incorporated in a separate volume. The book is going to be very unhandy if we keep

on including these various items in it. I have no objection to it personally, but I think the matter should be very carefully considered before Mr. Seley's motion is adopted.

O. C. Cromwell (B. & O.): The book is becoming very unwieldy and very bulky to handle. We now omit certain portions of the proceedings of the convention from the Annual Report, and publish them in a separate volume. Why cannot we take more out of it? Split it up into two volumes. It is unwieldy and it takes considerable time to locate the information you desire. I think the subject ought to be pretty thoroughly discussed before you take action on it.

J. J. Tatum (B. & O.): I think our book of proceedings is becoming too unwieldy. The more we add to it the more difficult it becomes to handle the book. The car inspectors must refer to the book continually. It is too unwieldy in its present form. It takes some time to train the car inspectors to get acquainted with the book, so that they will understand how to locate the information they desire. When adding in these rules for loading long material and some of the other things which we put in the book, they will not know where they are at, and you must remember that the class of employees that we get to do this work are not the best men in the country, with the best brains, and for that reason we must use judgment as to what is put into the book.

Mr. Seley: I did not know that the Baltimore & Ohio furnished the car inspectors with our proceedings. I will admit that the last volume is rather large, but the discussions might have been condensed considerably without affecting its value. Then the report of the committee on air brakes, which is a very valuable contribution to the literature on the subject, increased the size of the report last year, but it is not paralleled in our reports of this year so far as I know, and I do not believe our volume for this year with what is included in my motion will be as large a book as the one for 1910.

T. H. Goodnow (L. S. & M. S.): I think that it would reduce the size of the book if the part relating to the standards and recommended practice be published separately, simply retaining in the proceedings the standards which are required the most, not the standards which are required by the inspectors, but by the officers; the inspectors would not have to carry a book of that size, but still the cuts would be in it, and for further information reference could be made to a separate volume.

The President: Mr. Seley's motion is that the code of interchange rules and the rules for loading long materials be incorporated, and that the text and sheets of the standards of recommended practice be retained in the report of the proceedings, while the arbitration committee's decisions be eliminated.

The motion was carried.

The Secretary: In regard to paragraph 80, if agreeable to the convention the secretary will see that the committee on the revision of standards and recommended practice will get the result of the letter ballot, so that whatever changes they think necessary in the standards can be made.

#### TRAIN BRAKE AND SIGNAL EQUIPMENT.

A number of subjects relative to train-brake and signal equipment were assigned to the committee for investigation and report. These subjects will be taken up and reported on in the order presented.

##### EFFICIENT TRUCK BRAKE FOR CARS EQUIPPED WITH ALL-STEEL OR STEEL-TIRED WHEELS.

"To investigate the question of brake efficiency on cars equipped with all-steel or steel-tired wheels."

The committee on standards, in its report to the convention last year, paragraph 31, page 70, reported as follows:

"A member suggests the following: While text or sheet does not specify that steel or steel-tired wheels, for freight cars, must be 33 in. in diameter when new, it is assumed that the diameter new is to be in accordance with the recommended practice for cast-iron wheels. That this question be referred to the committee on car wheels, with instructions to look into the question of proper diameter for such wheels, in so far as maintaining the proper height of couplers for steel freight cars, also in maintaining effective brakes when wheels are worn to the limit, as trouble is experienced in holding couplers on steel cars within the limits, also as the brake details are now such that an effective brake can not be maintained. This question is referred jointly to the committee on train brake and signal equipment and to the committee on car wheels."

A communication was received by the chairman of this

committee from the chairman of the standing committee on car wheels, which indicated that the wheel committee would recommend 33-in. maximum diameter of wheels for all-steel and steel-tired wheels, but would make no recommendations concerning the minimum diameter, or when worn to limit. From a compilation of the data received in answer to circular inquiry of the wheel committee the committee has assumed, for the purpose of consideration of this subject, a diameter of 30 in. when wheel is worn to limit. By making several truck-brake layout drawings it was found that the additional brake travel due to decreased diameter of wheels can be readily taken up by means of additional holes in the bottom of connection rod jaws.

The committee recommends that sketch of bottom rod, detail Fig. 1, be shown on Plate 18 to cover bottom-rod details for cars having inside-hung brakes and equipped with all-steel or steel-tired wheels; the inside pin holes to be used with new wheels.

##### ANGULARITY OF BRAKE-BEAM HANGERS.

"To investigate the question of angularity of brake-beam hangers."

The committee on standards reported last year, see paragraph 32, page 70, of 1910 Proceedings, as follows:

"A member suggests to advance to standard the following recommended practice, under the head of 'Brake Beams,'



R. B. Kendig.

Chairman, Committee on Train Brake and Signal Equipment.

"The brake hangers shall have an angle as nearly as possible to ninety degrees from a line drawn from the center of the brake shoe to the center of the axle when shoes are half-worn. This matter is referred to the committee on train brake and signal equipment, with the request that they investigate the question of angularity of brake hangers before any action is taken to advance to standard."

This subject is somewhat involved by the increasing use of all-steel and steel-tired wheels on freight cars, with the consequent difference in diameter of wheels when new and worn to limit. The wheel committee has made recommendations as to maximum diameter for all-steel and steel-tired wheels, but has left open the question of diameter when wheel is worn to limit. It is obvious that an angle of brake beam hanging suitable for a new 33-in. wheel would be objectionable when wheel is worn to limit, and some compromise angle would have to be selected. The committee recommends, therefore, that the question of advancing to standard the before-mentioned recommended practice be deferred until the committee has more data and time for consideration of the subject.

##### TRIPLE VALVE TEST RACK AND CLEANING AIR BRAKES.

"To consider whether the recommended practice covering cleaning of air brakes and diagrams of triple valve test rack should be advanced to standard."

This subject was referred by the committee to J. L. Burton and B. P. Flory, as a subcommittee, whose report is as follows:

"A member of the association suggests advancing to standard the association's recommended practice on Clean-



ing Air Brakes. The recommended practice, as adopted in 1902, having become in part obsolete through the almost general adoption of a more modern brake equipment than was in use when the present recommended practice was adopted, the committee does not concur in the suggestion, and submits herewith a proposed revised code of instructions on the maintenance of freight brakes, which, if adopted, will be ap-

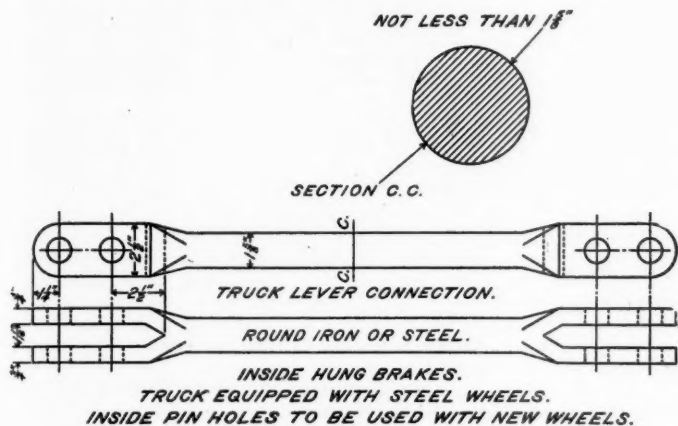


Fig. 1—Bottom Rod for Truck Brakes.

plicable to all types of brake equipment now in general use on freight equipment cars.

"The topical discussion at the 1909 convention on Cleaning of Triple Valves and Brake Cylinders on Freight Cars to meet the requirements of the Interstate Commerce Commission (see pages 348-367 of the 1909 Proceedings), with which the members have had an opportunity to become familiar, has been used by the committee as a basis on which to construct its report. The committee acknowledges its indebtedness to Mr. A. L. Humphrey, vice-president and general manager of the Westinghouse Air Brake Company, and to Mr. F. M. Whyte, general manager of the New York Air Brake Company, for the interest taken in this work.

"In the discussion at the 1909 convention, referred to above, reference was made to the experiments which had been conducted on the Pennsylvania with the operation of triple valves in passenger service without lubricant, and it was suggested that members of the association make similar experiments with triple valves in freight service. In pursuance to the suggestion outlined at the 1909 convention, a member of the association's committee on train brake and signal equipment had placed in freight and coal service on the Philadelphia & Reading and the Central of New Jersey, during the latter part of 1909 and the early part of 1910, 1,500 Westinghouse K-2 triple valves containing no lubricant; also, for comparative test, 1,000 additional triple valves which had been lubricated with a suitable composition of oil and graphite. A large number of the lubricated and non-lubricated valves were removed from the cars after they had been in service for twelve to fourteen months, and were carefully inspected and tested before and after clearing. Briefly stated, the investigation thus far shows the following results:

"*Lubricated Valves:* After being in service twelve to fourteen months, 65.66 per cent. of the valves tested passed all test before they were cleaned; 21 per cent. failed on charging the auxiliary reservoir in the prescribed time because of the valves being dirty. After cleaning, 86.36 of the lubricated valves tested passed all test.

"*Non-lubricated Valves:* After being in service twelve to fourteen months, 37.2 per cent. of the valves passed all test before cleaning; 36 per cent. failed on charging the auxiliary reservoir in the specified time. After cleaning, 90.69 per cent. of the non-lubricated valves tested passed all test. All of the slide valves, slide-valve seats, bushing and packing rings were highly polished and showed no ill effects from lack of lubricant. Eliminating the defects that caused the lubricated and non-lubricated valves to pass, the prescribed test which would not be influenced by the application of lubricant, there was no appreciable difference in the performance of the lubricated and non-lubricated valves.

"While the committee does not feel that the scope of its investigation has been sufficiently broad to justify any definite recommendations on discontinuing the application of lubricant to triple valves, it does feel that the subject is of sufficient importance to justify a more thorough investigation than the committee has been able to make. As a conclusion to its report, the committee presents the following

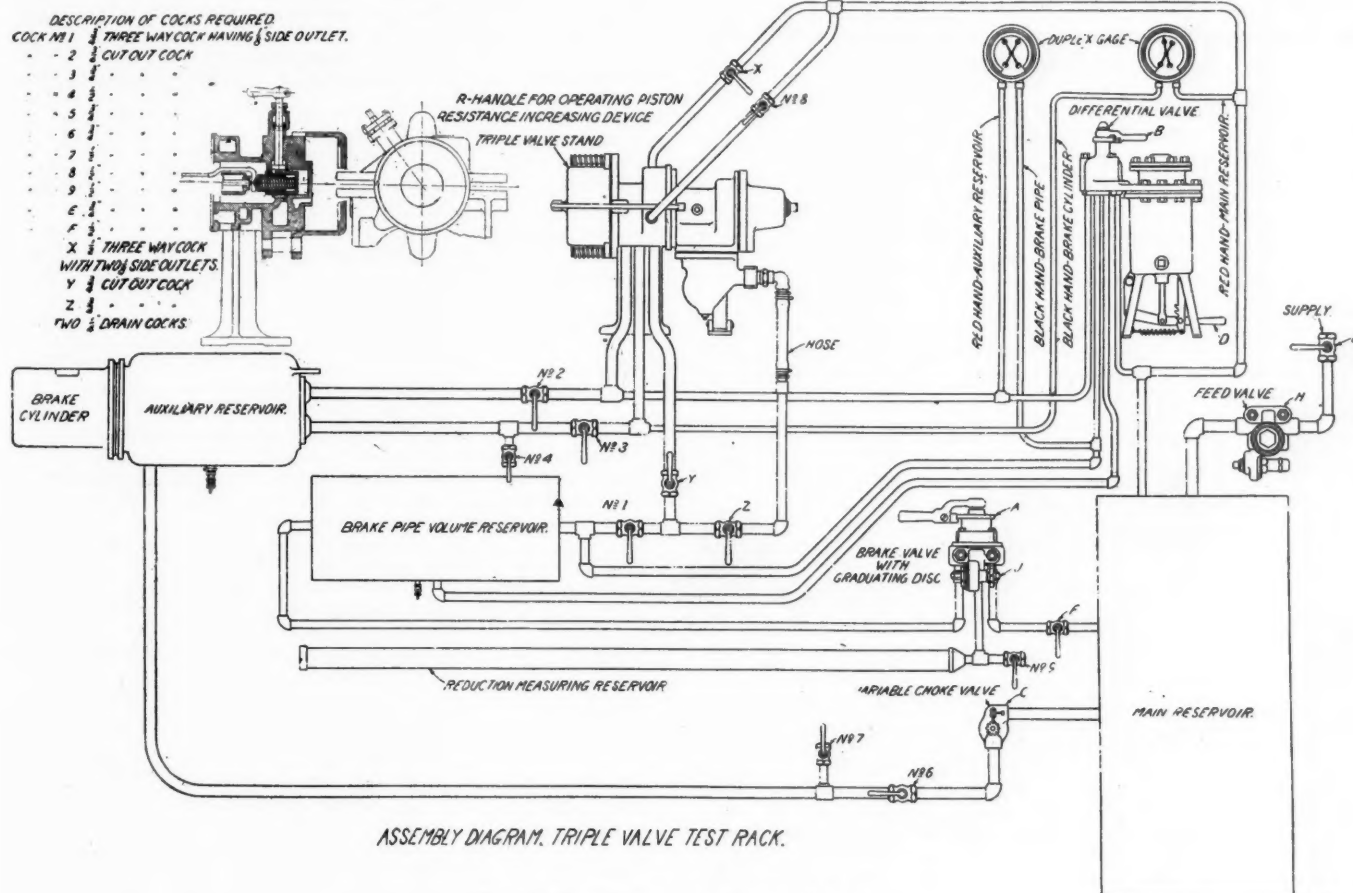


Fig. 2—Test Rack for Triple Valves.

proposed instructions on the inspection, repairs and test of freight brakes, and suggests its adoption as recommended practice."

#### ANNUAL REPAIRS TO FREIGHT-CAR AIR BRAKES.

##### *Inspection: Cleaning and Lubricating Triple Valves.*

The triple valves should be removed from the car for cleaning in the shop, and should be replaced by a triple in good condition. It should be dismantled and all the internal parts, except those with rubber seats and gaskets, cleaned with gasoline, then blown off with compressed air and wiped dry with a cloth.

The slide valve and graduating valve must be removed from the triple piston and retarded release parts from the body in order that the service ports in the slide valve and other parts may be properly cleaned.

No hard metals should be used to remove gum or dirt or to loosen the piston packing ring in its groove.

The feed groove should be cleaned with a piece of wood, pointed similar to a lead pencil. Bags or cloth should be used for cleaning purposes rather than waste, as waste invariably leaves lint on the parts on which it is used.

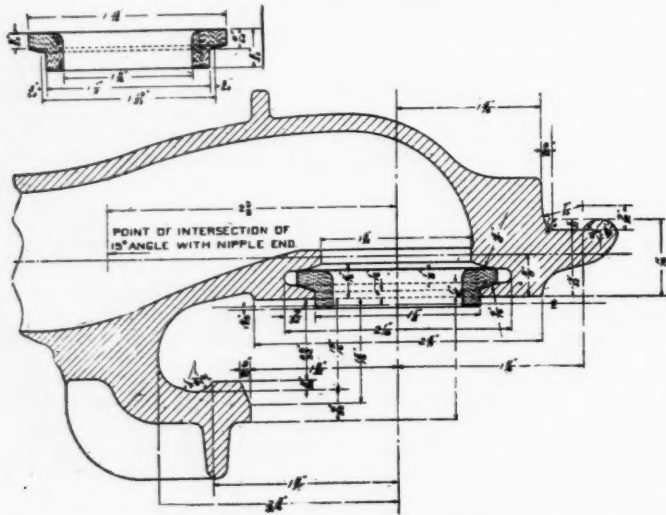


Fig. 3—Proposed Standard Coupling and Packing Ring for Air Brake Hose.

In removing the emergency valve seat, care must be exercised not to bruise or distort it.

Particular attention should be given the triple-piston packing ring. It should have a neat fit in its groove in the piston, and also in the triple-piston bushing; once removed from the piston, or distorted in any manner, it should be scrapped. The fit of the packing ring in its groove and bushing and the condition of the bushing should be such as to pass the prescribed tests.

The graduating stem should work freely in the guide nut. The graduating spring and the retarded release spring in retarded release triple valves must conform to standard dimensions and be free from corrosion. The thread portion of the graduating stem guide should be coated with oil and graphite before reapplying it to the triple cap.

The triple valve piston and the emergency valve must be tested on centers provided for the purpose to insure same being straight. The emergency-valve rubber seat should invariably be renewed unless it can plainly be seen to be in first-class condition, which is seldom the case. A check-valve case having cast-iron seat should be replaced with a case having a brass seat.

The cylinder-cap gasket and check-valve case gasket to be carefully examined and cleaned with a cloth; but should not be scraped. All hard or cracked gaskets to be replaced with new ones.

Standard gaskets as furnished by the air-brake manufacturers should be used. The use of home-made gaskets should be avoided, as the irregular thickness results in leakage and causes triple-piston stem to bend or break.

The tension of the slide-valve spring should be regulated so that the contour of same be such as will bring the outer end  $\frac{1}{8}$ -in. higher than the bore of the bushing when the outside end of the spring touches bushing when entering.

Before assembling the parts after cleaning, the castings and ports in the body of the triple valve should be thoroughly blown out with compressed air, and all parts of the triple

not elsewhere provided for known to be in good condition.

Lubricate the seat and face of the slide valve and slide valve graduating valve with high-grade very fine dry graphite, rubbing it onto the surface and the upper portion of the bushing where the slide-valve spring bears, so as to make as much as possible adhere to and fill up the pores of the brass, leaving a very thin coating of free graphite. The parts to be lubricated with graphite must be free from oil or grease.

Rub the graphite in with a flat pointed stick over the end of which a piece of chamois skin has been glued. At completion of the rubbing operation a few light blows on the slide valve will leave the desired light coating of loose graphite.

The triple-valve piston packing ring and its cylinder should be lubricated with either a light anti-friction oil or a suitable graphite grease as follows:

Apply a light coating to the packing ring and insert the piston and its valves in the body leaving them in release position, then lubricate the piston cylinder and move the piston back and forth several times, after which remove the surplus from the outer edge of the cylinder to avoid leaving sufficient lubricant to run on the slide valve or seat while the valve is being handled or stored ready for use.

No lubrication to be applied to the emergency piston, emergency valve or check valve.

All triple valves after being cleaned or repaired must be tested, preferably on a rack conforming to the attached print, and pass the test prescribed under the subject of "Triple Valve Tests" before being placed in service.

Should any of the triple-valve bushing require renewing, such work should be done by air-brake manufacturers.

Triples in which packing rings are to be renewed, slide valve or graduating valves renewed or faced, if the latter is of slide type, should be sent to a central point or general repair station for repairs.

When applying the triple valve to the auxiliary reservoir, the gasket should be placed on the triple valve, not the reservoir.

##### *Cleaning: Lubricating and Inspection of the Brake Cylinders.*

First, secure the piston rod firmly to the cylinder head, then, after removing the non-pressure head, piston rod, piston head and release spring, scrape off all deposits of gum and dirt with a putty knife or its equivalent, and thoroughly clean the removed parts and the interior of the cylinder with waste saturated with kerosene.

Packing leather must not be soaked in kerosene oil, as same destroys the oil filler placed in the leather by the manufacturers, opening the pores of the leather and causing the same to become hard.

Particular attention to be paid to cleaning the leakage groove and the auxiliary tube. Triple valve must be removed when the auxiliary tube is being cleaned.

The expanding ring when applied in the packing leather should be a true circle and fit the entire circumference, and have an opening of from  $\frac{3}{16}$  in. to  $\frac{1}{4}$  in; when removed from the cylinder the ring opening should be  $1\frac{1}{2}$  in. to  $1\frac{9}{16}$  in., and with this opening, of course, will not be a true circle.

A packing leather which is worn more on one side than the other should be replaced with a new one of uniform thickness, or turned so as to bring the thin side away from the bottom of the cylinder. The piston should be turned each time the cylinder is cleaned. In putting a packing leather on piston, it should be so placed as to bring the flesh side of the leather next to the cylinder walls.

Followers studs to be firmly screwed into the piston heads, and nuts on same to be drawn up tight before replacing the piston.

The inside of the cylinder and packing leather to be lightly coated with a suitable lubricant, using not more than 4 ounces nor less than 3 ounces per cylinder.

Part of the lubricant should be placed on the expander ring, and the adjacent side of the packing leather, thus permitting the air pressure to force the lubricant into the leather at each application of the brake.

No sharp tools should be used in placing the packing leather into the cylinder.

After the piston is entered and before the cylinder head is replaced the piston rod should be slightly rotated in all directions, about three inches from the center line of the cylinder, in order to be certain that the expanding ring is not out of place.

In forcing the piston to its proper position in the cylinder, the packing leather will skim from the inner walls of the cylinder any surplus lubricant that may have been applied.





At the completion of this test, open cocks 2 and 3 in the order given.

*Sec. "B," Test No. 2.—Leakage at Exhaust in Release Slide Valve of Emergency-valve Leaking.*

Open cock 1, and after the brake-cylinder pressure is exhausted close cock 3 and again coat the exhaust port with soapsuds to determine if there is any leakage from the auxiliary reservoir to the brake cylinder past the slide valve when the triple valve is in release position, or from the brake pipe to the brake cylinder past the emergency valve or its seat, when the differential on the emergency valve is high. Open cock 3, then paint the body of the triple valve with soapsuds to determine if leakage exists direct to the atmosphere through castings or gaskets.

If leakage is discovered at the triple exhaust in release position, determine if it is from the auxiliary reservoir or brake pipe in the following manner:

Move valve *A* to position No. 8 and open cock 7 until the brake pipe and auxiliary reservoir are empty; then with the valve *J* in position No. 3, place a soap bubble on the exhaust port and valve *A* in position No. 2. If no leakage is found at the exhaust, advance valve *J* by stages from position to position until a brake-pipe pressure of 10 lbs. is obtained. Any leakage from the exhaust while the auxiliary reservoir is without pressure must be from brake pipe, past the emergency valve. Therefore, if no exhaust leakage is found and leakage did exist while the auxiliary reservoir was charged, it indicates defective slide valve. At the completion of this test, close cock No. 7 and move valve *A* to position No. 1, recharging auxiliary reservoir.

*Sec. C, Test No. 2.—Graduating-valve Leakage.*

Move valve *A* to position No. 7 until a brake-cylinder pressure of from 20 to 30 lbs. is obtained. Then return valve *A* to position No. 3 and close cock 3. If the brake-cylinder pressure then increases without leakage at the exhaust port, it is proper to assume that the graduating valve is leaking, providing it has been determined by the preceding tests that the emergency valve is tight. If leakage at the exhaust occurs during this test, which will be determined by placing a soap bubble on the exhaust, the leakage may be either from slide valve or graduating valve. The rate of rise of pressure on the brake-cylinder gage, resulting from graduating-valve leakage must not exceed 5 lbs. in 20 seconds. This comparatively rapid rate of rise is permissible owing to the extremely small volume of the section of brake-cylinder pipe into which the leakage is occurring.

At the completion of test, open cock 3 and move valve *A* to position No. 1.

*Sec. A, Test No. 2.—Non-quick Service, New York Triple Valve, Leakage at Exhaust in Emergency, Check-Valve, Quick-action Valve and Cylinder-cap Gasket Leakage.*

Operate the triple valve two or three times in quick action by closing and opening cock 1, finally leaving it closed.

Coat the exhaust port of triple valve with soapsuds to ascertain if leakage exists past the exhaust valve or bushing with the piston and valve in emergency position. Close cocks 2 and 3. If the brake-cylinder gage now indicates leakage greater than 5 lbs. in 10 seconds the leakage is excessive, and is usually due to imperfect seating of the check valve or quick-action valve, or to the main piston not making a tight joint on the main-cylinder gasket. To locate the defect place soap bubbles on the vent ports. No leakage at these points indicates that the leakage is past the main-cylinder gasket. If leakage is found at the vent ports, open cocks 1, 2 and 3 and recharge the auxiliary reservoir to 80 lbs., then move valve *A* to position No. 7 until the brake-pipe pressure is reduced to 10 lbs. and return valve *A* to position No. 3. Close cock 2, and if the quick-action valve is leaking the brake will immediately release. If it does not, the leakage is past the check valve.

At the completion of this test, if no leakage were found, open cocks 1, 2 and 3, and if leakage were discovered open cock 2 and move valve *A* to position No. 1.

*Sec. B, Test No. 2.—Exhaust-valve Leakage in Release; also Vent-valve and Quick-action Valve Leakage.*

Close cock 3 and coat the exhaust port with soapsuds to determine if there is any leakage from the auxiliary reservoir past the exhaust valve, or graduating valve or triples having this valve tandem with the exhaust valve, when the triple is in release position. If exhaust leakage is found, the triple under test has tandem exhaust and graduating valves, determine which valve is leaking by making graduating-valve leakage test.

*Sec. C, Test No. 2.—Graduating-valve Leakage.*

Move valve *A* in position No. 7 until a brake-cylinder pres-

sure of from 20 to 30 lbs. is obtained. Then return valve *A* to position No. 3 and close cock 3. If the brake-cylinder pressure then increase without leakage at the exhaust port, it is proper to assume that the graduating valve is leaking. The rate of rise of pressure on the brake-cylinder gage, resulting from graduating-valve leakage, must not exceed 5 lbs. in 20 seconds. This comparatively rapid rise is permissible owing to the extremely small volume of the section of brake-cylinder pipe into which the leakage is occurring.

If leakage at the exhaust occurs during this test, which will be determined by placing a soap bubble on the exhaust, the leakage is by the exhaust valve instead of the graduating valve.

At the completion of the test open cock 3 and move valve *A* to position No. 1.

*Test No. 3.—Test of Type K Triple Valves for Retarded-release Feature; for Both Westinghouse and New York Triple Valves.*

Commencing the test with cocks 1, 2, 3 and 9 open, all other numbered cocks closed, auxiliary reservoir charged to 80 lbs., valve *B* in position No. 3 (lap), lever *D* in position No. 2 and valve *A* in position No. 3 (lap), proceed as follows:

Move valve *A* to position No. 7 until brake-pipe pressure is reduced 20 lbs., then return it to position No. 3; place valve *J* in position No. 4; valve *B* in position No. 1 and valve *A* in position No. 2. This should move the triple-valve parts to normal (full release) position.

If the triple valve moves to retarded-release position, which is indicated by a contracted exhaust and slow release of brake-cylinder pressure, it indicates a weak or broken retarded-release spring, or undue friction in the retarding device.

Following this test, recharge the system to 80 lbs. by moving valve *A* to position No. 1 and valve *B* to position No. 2.

When the brake pipe and auxiliary reservoir are charged to 80 lbs. move valve *A* to position No. 7 until brake-pipe pressure is reduced 20 lbs., then return it to position No. 3. Place valve *J* in notch No. 8, lever *D* in notch No. 4, valve *B* in position No. 1 and valve *A* in position No. 2.

Under these conditions the triple-valve piston and slide valve should be forced to retarded-release position. If this does not occur it indicates that the retarded-release spring is not standard, or the retarding devices have excessive friction. Completing test, place valve *B* in position 3 and valve *A* in position 1.

*Sec. A, Test No. 4.—Application Test for Both Westinghouse and New York Triple Valves.*

If for any reason it is desired to make this test following an application and release produced by closing and opening cock 1, or the auxiliary reservoir has just been charged by opening cock 1, this test should be preceded by an application and release with valve *A*, for the purpose of insuring the slide valve being in its normal position.

Commencing the test with cocks 1, 2, 3 and 9 open, all other numbered cocks closed, valve *A* in position No. 1, valve *B* in position No. 2 and lever *D* in notch 3, then with the auxiliary reservoir charged to 80 lbs., proceed as follows:

To test triple valves for 8-in. cylinders, place valve *B* in position No. 4 and valve *A* in position No. 5.

To test triple valves for 10-in. cylinder, place valve *B* in position No. 4 and valve *A* in position No. 6.

In all of these tests the triple valve should move to application position without causing a discharge of air from the vent port of valve *B*.

A failure to apply under the conditions specified indicates either excessive friction, which will be shown by an exhaust from the vent port or valve *B*; a leaky packing ring, which will be discovered later by the packing-ring leakage test; too large a feed groove in the cylinder, or a combination of two or more of these defects. Should the triple valve fail to apply and no exhaust occur from valve *B*, the indications are that the back flow of air from the auxiliary reservoir to the brake pipe is too rapid to permit the required differential.

At the completion of this test move valve *B* to position No. 3 and valve *A* to position No. 1.

*Sec. B.—Quick-service Test (for Quick-service Triple Valves Only) for Both Westinghouse and New York Triple Valves.*

Commencing the test with cocks 1, 2, 3 and 9 open, all other numbered cocks closed, valve *A* in position No. 1, valve *B* in position No. 3 and auxiliary reservoir charged to 80 lbs., proceed as follows:

Close cock 9 and move valve *A* to position No. 7 for all 8-in. and 10-in. triple valves. The brake-cylinder pressure obtained should not be less than 5 lbs. greater than that which will be obtained by subjecting to the same test triple valves which do not contain the quick-service features.



At the completion of this test move valve *A* to position No. 1 and open cock 9.

*Test No. 5.—Packing-ring Leakage Test for Both Westinghouse and New York Triples.*

Release Test, Sec. 1.—Commencing with cocks 1, 2, 3 and 9 open, all other numbered cocks closed, valve *A* in position No. 1, valve *B* in position No. 3 and the auxiliary reservoir charged to 80 lbs., proceed as follows:

Place the valve *A* in position No. 7 until the brake-pipe pressure is reduced 15 lbs., then return to position No. 3 (lap). Place valve *J* in position No. 2, lever *D* in notch No. 1 and valve *B* in position No. 1; close cocks 2 and 3 and move valve *A* to position No. 2. If the discharge does not occur promptly from the vent port of valve *B*, advance valve *J* from position to position until the discharge begins, then note the rate of increase of pressure on the auxiliary reservoir gage, which must not exceed 5 lbs. in 30 seconds.

During this test there must be a steady exhaust of air from the vent port of valve *B* to insure the proper differential being maintained on the triple-valve piston. If, in making this test, the triple valve for the 8-in. cylinder releases or indicates excessive ring leakage, make another test, beginning with moving handle *R* to the right after making the proper brake-pipe reduction and before starting to increase the brake-pipe pressure. Immediately after the test is completed, handle *R* should return to its normal left position.

Should it occur that the friction of the triple valves for the 10-in. brake cylinder is so low as to continue to permit the triple to release, the reduction for the application may be changed from 15 to 10 lbs. When this is done, special attention should be given to determining if the graduating valve is right, as it must be, to permit an accurate test.

At the completion of this test place valve *B* in position No. 3, open cocks 2 and 3 and place valve *A* in position No. 1.

*Test No. 6, Sec. 2.—Friction Test. Release Test for Both Westinghouse and New York Valves.*

Commencing the test with cocks 1, 2, 3 and 9 open and all other numbered cocks closed, valve *A* in position No. 1, valve *B* in position No. 3, auxiliary reservoir charged to 80 lbs.

Place lever *D* in notch 3 for all triple valves undergoing the test; proceed as follows:

Place valve *A* in position No. 7 until the brake-pipe pressure is reduced 10 lbs., then return it to position No. 3. Place valve *J* in position No. 1, valve *B* in position No. 1, and move valve *A* to position No. 2. Under these circumstances the triple valve should release. A failure to release should be accompanied by a discharge at the vent port of valve *B*, which indicates that the frictional resistance to the movement of the packing ring and slide valve is excessive.

If the triple valve does not release and valve *B* fails to open its exhaust, leakage is occurring from the brake pipe, which will necessitate advancing valve *J* from position to position, remaining in each position 30 seconds, until the triple valve releases or the exhaust in valve *B* opens.

At the completion of the test place valve *B* in position No. 3 and valve *A* in position No. 1.

*Test No. 7, Sec. A.—Service-port Capacity Test for Westinghouse Triple Valves and Quick-service New York Triple Valves.*

Commencing with cocks 1, 2, 3, 4 and 9 open, valve *A* in position No. 1, valve *B* in position No. 3, place valve *C* in position required for the triple valve under test, as indicated:

Notch No. 1.—For 8-in. triple valves.

Notch No. 2.—For 10-in. triple valves.

During this test the brake-pipe pressure should not drop, except that in the case of the quick-service triple valves there will, of necessity, be a slight drop, which must not exceed 2 lbs.

Place valve *B* in position No. 2 and move valve *A* to position No. 3, open cock 7 until brake-pipe and auxiliary-reservoir pressures are reduced to 50 lbs., then close cock 7. Move valve *B* to position No. 3 and open combination cock 6 and quick-opening valve, leaving it open 3 seconds. This test should not produce quick action. If it does, it indicates a restriction in the service port, or a weak or graduating spring.

SEC. B.—Duplicate the tests specified under Sec. A, placing the wheel of valve *C* in the position as indicated.

Notch No. 3.—For 8-in. triple valves.

Notch No. 5.—For 10-inch triple valves, excepting Westinghouse non-quick service, with which use notch 7.

This should result in the triple valve moving to emergency position. Failure to do so indicates too close a fit of the emergency piston.

At the completion of the test close cock 4 and combination cock 6 and quick-opening valve, move valve *A* to position No. 1.

*Test No. 7, Sec. A.—Service-port Capacity Test for New York Non-quick Service Triple Valves.*

Commencing with cocks 1, 2, 3, 4, and 9 open, valve *A* in position No. 1, valve *B* in position No. 3, place valve *C* in position required for the triple valve under test, as indicated.

Notch No. 1.—For 8-in. triple valves.

Notch No. 2.—For 10-in. triple valves.

Place valve *B* in position No. 2 and move valve *A* to position No. 3. Open cock 7 until brake pipe and auxiliary reservoir pressure are reduced to 50 lbs., then move valve *B* to position No. 3 and open cock 6 quickly.

NOTE.—During this test the triple valve should move to service position, the brake-pipe pressure must not drop and there must be no discharge of air from the vent ports.

Should the triple valve move to emergency position, it indicates a restriction in the service ports or a weak vent-valve spring.

SEC. B.—Duplicate the test specified under Sec. A, placing the wheel of valve *C* in the position as indicated for the triple valve under test.

Notch No. 3.—For 8-in. triple valves.

Notch No. 5.—For 10-in. triple valves.

This should result in the triple valve moving to emergency position, causing a strong blast of air from the vent posts and a brake-pipe reduction of at least 3 lbs. Failure to do so indicates a too loose fit of the vent-valve piston packing.

#### AIR-BRAKE HOSE COUPLINGS.

"To investigate and report on the question of standard dimension for air-brake hose couplings, gaskets and gages for new and worn hose couplings, and possibly signal-hose couplings."

This subject is referred to in paragraph 37, page 71, of the 1910 Proceedings:

"The report of committee on air-brake hose to the 1909 convention, with particular reference to 'standard dimensions of air-brake hose couplings and gaskets,' was received and referred to the committee on standards for further investigation and report. Inasmuch as this involved the design of the air-brake hose coupling, gasket and gages for both new and worn air-brake hose couplings, and should possibly be extended to signal-hose couplings, the committee felt that this matter should have been referred to the standing committee on train-brake and signal equipment, who have direct jurisdiction over the designing and interchangeability of these parts, and accordingly referred this subject to the committee on train-brake and signal equipment by letter, dated August 10, 1909, through the secretary of the association, who advised, under date of August 13, 1909, that the matter had been so referred."

The committee delegated this section of its work to a sub-committee, and its report, concurred in by all the members of your committee, follows:

#### Air-brake Hose Couplings and Packing Rings.

In its investigations the committee assumed that all air-brake hose couplings and packing rings now in use were supplied by the Westinghouse Air Brake Company and the New York Air Brake Company, or in accordance with their standard dimensions; and therefore the question of the best possible interchange of proposed standard and existing couplings and rings has received due consideration.

For the purpose of determining whether there are sufficient variations in the dimensions of various makes of couplings to justify the association in adopting a standard with a view of securing a more satisfactory interchange, more than 5,000 new and used couplings have been gaged and tested. This investigation revealed the fact that the dimensions of couplings which should be common to all makes vary appreciably in couplings supplied by different manufacturers.

Enlarged drawings have also been made showing the variations in the principal dimensions employed by the Westinghouse Air Brake Company and the New York Air Brake Company in the design of their respective coupling and packing ring. Outlines of the former and details of the latter show that there is a difference of 1/64 in. in the nominal height of a Westinghouse and a New York packing ring. Also, there is 3/64 in. difference in one of the principal dimensions of the couplings affecting the compression of the rings.

When two Westinghouse couplings, with Westinghouse packing ring in each, are coupled together, the nominal compression of each packing ring is 3/128 in. When the couplings are pulled apart (as is the case when cars are uncoupled without first parting the hose) the faces of the hose couplings are 1/32 in. apart.

With two New York couplings, having a New York packing ring in each, coupled together, the compression of each ring is nominally  $1/32$  in.; and when the couplings are pulled apart, the space between the faces of the couplings is only  $1/64$  in.

If Westinghouse packing rings are used in New York couplings, the compression of each ring will be  $3/64$  in., or  $1/64$  in. greater than when New York packing rings are used in New York couplings. A combination of New York packing rings and Westinghouse couplings will reduce the nominal compression of the latter to  $1/128$  in.

The permissible variation in the nominal compression of the rings, with the existing standards of the air-brake manufacturers, is therefore in the ratio of 6 to 1, or 600 per cent., which, in the judgment of the committee, justifies the association in considering the adoption as standard, or recommended practice, such dimensions relating to air-brake hose couplings and packing rings as will insure greater protection against leakage and lessen the damage to hose when "pulled apart" than is now possible.

The New York Air Brake Company recommends adding  $1/16$  in. radius at the back or larger diameter of ring groove, to insure more satisfactorily machining the groove to specified dimensions without burning off the corners of the tool with which the groove is cut. Adding this radius to the groove will not affect the fit of the proposed or existing packing rings. The committee therefore concurs in the suggestion.

A member of the train-brake and signal committee recommends revising the proposed standard as recommended in 1909 to provide for the reinforced guard arm which is now an important feature of both the Westinghouse and New York couplings. The guard arm in no way affects the interchange of couplings, and the committee believes it should be provided for in the proposed standard.

#### *New Proposed Standard Coupling.*

Fig. 3 shows the detail drawing, as submitted by the air-hose committee in 1909, revised to provide for a better interchange with the New York couplings. The revision consists of an outline of the reinforced guard arm, a  $1/16$ -in. radius at the back of the groove for the packing ring, and of a second,  $3/16$ -in. and  $5/32$ -in., radius in the groove of the guard arm and at the outer lug.

For convenient reference, the packing ring as recommended in 1909 is also shown in detail in Fig. 3.

Leakage at the packing ring and damage to hose when "pulled apart" will depend largely upon the permissible variation in nominal dimensions to meet manufacturers' requirements. The question of maximum variation in nominal dimensions affecting the compression of the ring and the clearance between faces of coupling has therefore been thoroughly investigated by (as previously stated) "gaging and testing over 5,000 couplings" and a number of packing rings. Couplings which were found to slightly vary from the manufacturer's standard were tested under air pressure on a pulling machine, with which could be approximated the strains to which the hose is subjected in service through the slack action and curving of cars. Notwithstanding the fact that no tests were made with frozen hose (which is, perhaps, the severest service test for ring leakage that can be made), the investigation leads to the conclusion that the air-brake manufacturers can be depended upon to supply their hose couplings and rings with a degree of accuracy that will insure satisfactory service.

This conclusion does not apply, however, to packing rings secured in the open market. In gaging and testing a large number of sample packing rings which were supplied by various rubber companies, less than 10 per cent. of them were found to be fit for service. A number of these sample rings were represented by the rubber manufacturers to be "M. C. B. Standard," "perfect samples," etc.

If the members of the association care to consider securing packing rings in the open market, then suitable minimum and maximum gages for them should first be adopted (consideration of which does not come within the scope of the committee's investigation on couplings and rings).

It has been suggested that the association should adopt minimum and maximum dimensions for the couplings as a whole. This would affect further developments in the device, such as are now being made by the two leading air-brake companies in what may be termed a "hose-protector coupling," with which it is intended to minimize the tension in the hose when pulled apart. The committee has therefore confined its recommendations to nominal dimensions affecting the interchange of couplings and rings.

#### *Summary.*

Summarizing, it can be said that two couplings and packing rings conforming to the dimensions shown in Fig. 3 will couple together as satisfactorily and with equal assurance against leakage at the packing ring, and with as little damage to hose when pulled apart, as is now had with couplings and rings conforming to the standards of the Westinghouse Air Brake Company.

One of the proposed M. C. B. couplings and rings, as shown in Fig. 3, will interchange with couplings and rings conforming to the standard of the New York Air Brake Company more satisfactorily and with greater assurance against leakage and damage to hose when pulled apart than is now possible with a Westinghouse and New York coupling coupled together.

A proposed M. C. B. coupling and packing ring (as shown in Fig. 3) and a Westinghouse coupling and packing ring will interchange as satisfactorily and with equal assurance against leakage and damage to hose when pulled apart as will two couplings conforming to the standard of the Westinghouse Air Brake Company.

#### *Gages for Air-brake Hose Couplings.*

The question of gages for used air-brake hose couplings has been investigated with the view of determining proper contour lines of the gages. A number of used couplings have been gaged (and subsequently tested) with gages of such proportions and dimensions as to provide for condemning couplings with guard arms and lugs distorted or worn from  $1/128$  in. to  $1/32$  in.

Fig. 4 shows the dimensions which, in the judgment of the committee, are best suited for minimum and maximum gages for Westinghouse and New York couplings; but these dimensions were decided upon too late to permit of securing gages constructed in accordance therewith, and, realizing the importance of the subject, the committee does not feel justified in suggesting the adoption of these dimensions without first gaging (with the proposed gages) a sufficient number of couplings to confirm the committee's judgment in the premises. The committee therefore desires to report progress on the question of gages for air-hose couplings, and respectfully asks for further time in which to complete its investigation.

In concurring with the report of the subcommittee, the committee recommends the substitution of the dimensions and contour for air-brake hose coupling shown by Fig. 3 for the dimensions and contour shown with the Air Brake Hose Committee's report, page 180, of the 1909 proceedings. The committee also recommends, for reasons contained in the subcommittee's report, that the question of gages for air-hose couplings be deferred for a future report by the committee in which report will also be taken up the question of signal-hose coupling.

The report is signed by:—R. B. Kendig (N. Y. C.), chairman; T. L. Burton (C. of N. J.), B. P. Flory (N. Y. O. & W.), E. W. Pratt (C. & N. W.) and R. K. Reading (Penn.).

Mr. Burton presented the report and in connection therewith said: Mr. Goodnow brought up the point in the discussion this morning about stenciling the date when the triple valves were cleaned. The committee provides under *Cleaning* of the report the following: "All stencil marks to be scraped off or painted over with black paint. The place of cleaning, day, month and year to be stenciled with white paint, preferably on both sides of the cylinder or auxiliary reservoir; or, if it is not readily visible, in a convenient location near the handle of the release rod." The stenciling of the place, day, month and year is provided for, but we do not specify the road, as suggested by Mr. Goodnow. We believe that the method which we recommend will enable the road to locate the time the work was done. The idea is to put the car owner in a position where he can locate improper repairs before the bills are received. In many cases the bills for repairs do not come in for several months after repairs have been made, and we believe the recommendation we make will cover the matter.

#### *DISCUSSION ON TRAIN BRAKE AND SIGNAL EQUIPMENT.*

I. S. Downing (L. S. & M. S.): As I understand it, if the car can be placed between other air-brake cars, the card is to be tied near the triple valve. If it cannot be placed between these cars, it must be tied onto the train line near the angle cock. As this card is important to the switchmen, it seems to me it ought to be on the side of the car, where they can see it, and they should not be compelled to look under the car to find the card.

F. W. Brazier (N. Y. C. & H. R.): I want to call attention to the inferior gaskets which some roads buy—they are



not standard and do not fit properly, and we should frown on the purchasing agent who buys anything except what is absolutely correct. It is too paltry a thing, to get something by which you can save a few pennies, and then delay the trains. All gaskets which are not standard should be thrown in the scrap heap.

C. E. Fuller (U. P.): I would like to refer to the recommendation of the committee the matter of applying this defect card: "If car can be placed between air-brake cars, wire this card near triple valve where it can be readily seen. If car must not be placed between air-brake cars, wire card to brake pipe near angle cock at each end of car."

I do not believe the wiring of a card on a car is good practice. It is apt to be blown away. This is especially true out in the western country. The card should be fastened on the car so as to stay there. I do not think you can hold the card by tying it.

O. C. Cromwell (B. & O.), referring to Fig. 1: I think the dimension in the inner holes at the bottom of the jaw,  $2\frac{1}{2}$  in., is too short. I believe it should be  $2\frac{3}{4}$  in.—the beginning of the angle in the corner. I think that should be corrected.

Mr. Burton: A question was raised on the substitution of one card for two, and I will state in that connection that that one little point resulted in more labor on the part of the committee than all the rest of the report put together, and it was the experience of a number, who made it a point to investigate the question, to find that where two cards were provided the train crews applied whichever card they happened to have in their pocket regardless of the nature of the defect. As to attaching the card by wiring rather than nailing, I think the ability to keep the wired card on the car, to get the car to the repair station, depends on how soon you get it to the repair station. The committee did not feel that it was justified in asking train crews to carry tacks and a hammer in their pockets, when they could apply the tag with a wire. The question of the brake rod,  $2\frac{1}{2}$  in. from the center of the inner hole to the bottom of the jaw—it was intended to have it conform to the present recommendation—which the committee believes it does.

T. H. Goodnow (L. S. & M. S.): I would like to ask Mr. Burton if they are satisfied with a two-hole connection in the adjuster—whether they have made investigations and have been able to overcome the necessity of the three-hole connection.

Mr. Burton: I am sure that the two-hole connection will be satisfactory, if you have a proper adjustment. It will also depend largely on the spacing of the holes. The spacing of the two holes is not shown here from the fact that any given spacing would not be suitable for all proportion of truck levers. That proportion must be worked out. The points on which the committee suggested that action should be taken and adopted for recommended practice are the defect card, the bottom rod, the annual repairs to freight car brakes and the adoption of the hose coupling and packing ring. I would move that the foregoing be received and submitted to letter ballot for adoption as recommended practice.

Mr. Goodnow: Not having had an opportunity to read over the report of the arbitration committee, I would like to know if the features included in this report which we are considering have been taken care of in the report of the arbitration committee, or whether we must wait for a year before it will go into the rules of interchange. I refer to the provision regarding the marking of the place, day, month and year when the triple valve was cleaned.

Mr. Hennessey: No, I will say that has not been taken care of by the arbitration committee in the report which it will present at this meeting.

Adam LaMar (P. L. W. of P.): I believe that is taken care of in rule 9 of the interchange rules, which reads as follows: "Knuckles removed and applied, whether open or closed."

Mr. Downing: I think it is an important point that the distance between the pin holes in Fig. 1 be specified, if you have to add four holes to the bottom connection. We have more repairs with wrong bottom connections on the cars today than any other thing we get, and if the association can get something we can put on, even if it is a hole or two too many, it will help us out. We have cars coming in with 10-in. piston valves, and we find that some road has put on the wrong connection, and that applies to the inside hung brakes as well as the outside.

Mr. Burton: In reply to Mr. Downing, regarding the four holes, I would say that I can see no objection to adding more than two holes if they are necessary to take care of the variation in the proportioning of truck levers, which the committee had in mind, but I do not believe it will take care of the wrong

radius of cars on foreign lines, because the spacing of the inside hole will govern largely there, and the proportioning of truck levers also comes into play.

Mr. Downing: We had an interesting experience—we had four different lengths of levers—I cannot recall the lengths—but we cut them down to one or two levers by adding additional holes on the inside hung brakes.

Mr. Burton: I think the committee would be very glad to revise that cut, if it has the approval of the association, to show two holes at one end and three at the other, or three at each end, if desired, but still omit the dimensions. I think the dimensions would have to be omitted.

Mr. Garstang: I think the adding of a few more holes at each end, in view of the introduction of steel and steel-tired wheels in freight-car service, would be a good thing, and I move that the drawing show three holes in each end, in place of what is shown in the cut, two holes.

The motion was carried.

W. F. Bentley (B. & O.): There is one point under *Cleaning* which I think could be corrected by changing the reading a little, and might overcome some of the troubles which have been complained of here today, where the triple valves had to be cleaned too often. The part I refer to says that the triple valves, after being cleaned or repaired, must be tested, preferably on a rack conforming to the attached print. I think the word "preferable" should be cut out, because there is where most of the trouble comes from now. They are being tested from the yard-line pressure and from other different kinds of apparatus. They are unable to get the proper test: then the triple valve will show up defective in service, and other roads think that it needs cleaning again. Probably they in turn have no good way of testing them, and they are again put back on the car, and again give the same trouble. I think the word "preferable" should be cut out, and make it positive that they shall be tested on an approved testing rack.

Mr. Burton: In reply to Mr. Bentley's point, I think the cutting out of the word "preferable" would not make it binding that they should be tested on a rack, because it is simply recommended practice. The committee thought the word "preferable" would draw sufficient attention to the fact that it should be tested on a rack of that kind, and that if this rack test be made binding it would practically block any further developments in the rack as they come up from time to time, as has been done in the testing of triple valves. As far as the effect is concerned I think it would be as forcible if it remains as printed.

Mr. Burton's previous motion was then carried.

#### TEST OF BRAKE SHOES.

In addition to its usual duty of investigating the properties of brake shoes, the committee has, for two years past, given consideration to the standards applying to brake beams. This report accordingly deals with two rather distinct subjects, and it is presented in two distinct parts, brake shoes and brake beams.

##### BRAKE SHOES.

*Outline of Tests as Agreed Upon in December.*—Mr. Young, of the committee, was requested to act as a sub-committee to select and deliver to the laboratory samples of shoes used on heavy passenger cars in high-speed passenger service by the New York Central Lines, the Pennsylvania Lines and such other lines as might have shoes to submit.

It was agreed that the frictional qualities and the wear of the shoes submitted should be determined by applications to the 33-in. steel wheel of the Master Car Builders' brake-shoe testing machine in effecting stops at a speed of 80 m. p. h. All tests were to be at this speed, and brake-shoe pressures of 12,000, 14,000, 16,000, 18,000 and 20,000 lbs. respectively were to be employed. Each kind of shoe submitted was to be tested in triplicate; that is, three shoes nominally alike were to be subjected to tests for the determination of frictional qualities and wear.

It was agreed that in determining the wear under the foregoing conditions it would be sufficient to weigh the shoes after three applications. It was understood that between applications the shoe would be cooled to its initial temperature. It was agreed that no further investigations of wheel wear need be undertaken.

Mr. Kendig, of the committee, was requested to submit a summary of the results of the brake-shoe tests made under his direction in the fall of 1909 on the Lake Shore & Michigan Southern. Professor Schmidt was requested to submit the results of tests then in progress at the University of Illinois, which were designed to ascertain whether there is any material difference in the coefficient of friction as developed by the

use of the testing machine when the shoe is applied by weights, as in the Master Car Builders' testing machine, and when applied by means of an air-brake cylinder, as in service.

**Axle Loads.**—In any study of the possibilities of train braking, the facts concerning axle loads are of importance. From collected data it was found that an eight-wheel passenger coach of the Pennsylvania, weighing 119,000 lbs., gives the heaviest load per wheel, namely, a load of 14,875 lbs. Under the usual service applications the brake-shoe pressure would, of course, be less than this amount and could not, in the light of our present experiments, be regarded as excessive; but with modern equipment, in emergency applications, the brake-shoe pressure upon such a car may readily exceed 20,000 lbs.

**Performance of Shoes Under Test as Set Forth in the Accompanying Report by Dean Benjamin.**—The detailed report of tests which follows shows the precise results obtained as to coefficient of friction and wear from a considerable number of shoes when tested under the several different pressures up to and including 20,000 lbs. It is formally reported to the committee also that tests made at the laboratory of the University of Illinois have involved, without serious difficulty, brake-shoe pressures as great as 24,000 lbs. If it be assumed that a shoe in such service will rarely be called upon to withstand the conditions of an emergency stop from a speed as high as 80 m. p. h., it may also be assumed that shoes such as those tested may be regarded as reliable for such service. It is of the highest importance, however, to know that the value of the coefficient of friction decreases as

were the same as those which would be expected under service conditions on the road, conditions of speed and pressure, of course, being the same. The following brief report from Mr. A. S. Williamson, giving the results of such tests, may be accepted as conclusive evidence that the results are substantially the same in both cases: "Responding to the request of the brake-shoe committee, tests have been made upon the brake-shoe testing machine of the University of Illinois, in the course of which the shoe has been dropped upon the



W. F. M. Goss.

Chairman, Committee on Brake Shoe Equipment.

the pressure upon the shoe is increased. So great is this change in the coefficient of friction for some shoes that the length of stop is reduced but slightly by increasing the pressure from 18,000 to 20,000 lbs. On the other hand, the wear of all shoes increases rapidly with increase of pressure.

The tests herein reported were made at a speed of 80 m. p. h., and since the previous work of the committee does not involve such speeds, it has been impossible to tie up the results of the present series with those which have already been made of record by the committee. For this reason, it is impossible to judge from them the sufficiency of the present specifications for use in selecting shoes for very high-speed service. It has been suggested that in all probability a shoe which gives the best results under the present specifications will at least give good results under the higher speeds and pressures, such as are now being considered. Under the circumstances, it was thought best to present the results as obtained for the information of members, in the hope that later a series of tests may be made under heavy pressures at different speeds, which will permit such results to be connected with those underlying the present specifications.

**Coefficient of Friction as Determined Upon a Brake-Shoe Testing Machine When the Shoe is Applied by Weights and by Air.**—By the courtesy of Professor Schmidt, the University of Illinois undertook to determine the effect upon the coefficient of friction as found by experiment when the shoe was quickly applied, as by weight, and when more slowly applied, as by air. The purpose of this inquiry was to settle the question as to whether results obtained on the testing machine

INITIAL SPEED 80 MILES PER HOUR.			BRAKE SHOE PRESSURE 16000 POUNDS.			
NO. OF SHOE	DESIGNATION OF SHOE	STANDARD OF	COEFFICIENT OF FRICTION		LOSS per 10000000 FT. POUNDS OF WORK DONE- IN POUNDS	
			EACH SHOE	AVERAGE FOR EACH KIND	EACH SHOE	AVERAGE FOR EACH KIND
I	II	III	IV	V	VI	VII
333	CONGDON	B. & O.	8.80	8.68	2.92	2.36
336	CONGDON	B. & O.	8.56		1.80	
339	PLAINCAST IRON	PENN.	9.34	9.19	5.06	4.58
340	PLAINCAST IRON	PENN.	9.04		4.10	
345	SPEAR-MILLER	C. B. & Q.	8.15	8.42	5.06	5.03
346	SPEAR-MILLER	C. B. & Q.	8.70		5.01	
351	NATIONAL	C. M. & St. P.	8.60	8.67	5.02	4.00
352	NATIONAL	C. M. & St. P.	8.75		2.99	
357	DIAMOND-S	SOU. PACIFIC	8.46	8.73	4.20	3.44
358	DIAMOND-S	SOU. PACIFIC	9.01		2.68	
367	U-SHOE	NYC. LINES	8.96	8.72	4.98	4.94
368	U-SHOE	NYC. LINES	8.47		4.98	
376	PITTSBURG		17.20	17.75	2.94	2.54
377	PITTSBURG		18.30		2.14	

\* ACTUAL LOSS IN WEIGHT HAS BEEN MULTIPLIED BY 2.20 WHICH IS THE RATIO OF CAST IRON TO THE ABRADED PARTS OF THIS SHOE.

Fig. 1—Brake Shoe Pressure Tests: 16,000 Lbs.

wheel through the action of weights, and also by use of an arrangement of air equipment giving substantially the conditions of service. These tests were made with a great variety of shoes and under many different conditions of speed and pressure. Within the limits involved by these experiments, the mean coefficient of friction is practically independent of the manner in which the shoe is applied. The following results are typical:

DIAMOND S SHOE, Speed, 60 M. P. H.

Shoe Pressure.	Coefficient of Friction.
6,840 lbs.....	13.95 (weights)
6,840 lbs.....	14.15 (air)
12,000 lbs.....	12.25 (weights)
12,000 lbs.....	12.50 (air)

INITIAL SPEED 80 MILES PER HOUR			BRAKE SHOE PRESSURE 20000 POUNDS			
NO. OF SHOE	DESIGNATION OF SHOE	STANDARD OF	COEFFICIENT OF FRICTION		LOSS per 10000000 FT. POUNDS OF WORK DONE- IN POUNDS	
			EACH SHOE	AVERAGE FOR EACH KIND	EACH SHOE	AVERAGE FOR EACH KIND
I	II	III	IV	V	VI	VII
333	CONGDON	B. & O.	7.25	7.25	3.64	3.36
336	CONGDON	B. & O.	7.25		2.97	
339	PLAINCAST IRON	PENN.	7.04	7.21	6.34	6.50
340	PLAINCAST IRON	PENN.	7.39		6.06	
345	SPEAR-MILLER	C. B. & Q.		8.30	12.20	12.20
346	SPEAR-MILLER	C. B. & Q.	8.30		10.93	
351	NATIONAL	C. M. & St. P.	6.87	6.87	10.93	10.93
352	NATIONAL	C. M. & St. P.				
357	DIAMOND-S	SOU. PACIFIC	6.77	7.02	5.80	5.94
358	DIAMOND-S	SOU. PACIFIC	7.27		6.08	
367	U-SHOE	NYC. LINES	7.34	7.34	5.71	5.71
368	U-SHOE	NYC. LINES				
376	PITTSBURG		15.35	15.27	4.97	4.54
377	PITTSBURG		15.20		4.11	

\* ACTUAL LOSS IN WEIGHT HAS BEEN MULTIPLIED BY 2.20 WHICH IS THE RATIO OF CAST IRON TO THE ABRADED PARTS OF THIS SHOE.

Fig. 2—Brake Shoe Pressure Tests: 20,000 Lbs.

"The similarity of the coefficient of friction in the two cases is shown."

**Recommendations.**—In concluding the summary of the work of the past year, the committee recommends:

1. That some further work be undertaken by the association for the purpose of connecting the results obtained under high brake-shoe pressures with those upon which the Association's specifications are based.



2. That in the specifications of the committee, as presented in the report of 1910 paragraphs *c* and *f* be changed to read "steel or steel-tired wheel," instead of "steel-tired wheel."

The formal report of the tests made by Professor Louis E. Endsley under the direction of the committee during the current year is, in part, as follows:

"The tests were conducted upon the Master Car Builders' brake-shoe testing machine, a description of which will be found in the Proceedings of the Association for 1894 and 1906. The shoes tested were of seven different kinds. Six shoes of each kind were received at the university, and of this number two of each type, making fourteen shoes in all, were tested. None of the shoes had been in service prior to their receipt at the laboratory. All of the shoes were given a laboratory number. The numbers of the shoes tested are as follows: 333, 336, 339, 340, 345, 346, 351, 352, 357, 358, 367, 368, 376 and 377. A full description of each shoe tested follows:

INITIAL SPEED 60 MILES PER HOUR.

NO. OF SHOE	DESIGNATION OF SHOE	STANDARD OF	APPROXIMATE DISTANCE PER STOP, IN FEET UNDER THE FOLLOWING BRAKE SHOE PRESSURES				
			12000	14000	16000	18000	20000
I	II	III	IV	V	VI	VII	VIII
333	CONGDON	B.&O.	2205	2070	1791	1600	1548
336							
339							
340	PLAIN CAST IRON	PENN.	2472	1935	1755	1595	1656
345	SPEAR-MILLER	C. B. & Q.	2495	2010	1910	1805	1424
346							
351	NATIONAL	C. M. & ST. P.	2403	2050	1835	1730	1698
352							
357	DIAMONDS	SOU. PACIFIC	2261	1925	1801	1551	1633
358							
367	U-SHOE	NYC. LINES	2167	1964	1771	1660	1598
368							
376	PITTSBURG		1037	932	852	755	735
377							

Fig. 3—Distance of Stop Under Varying Pressures.

Shoe No. 333 was designated by the committee as a Congdon shoe, and was received from the Baltimore & Ohio. The dimensions of the shoe when it was received at the laboratory were: Length on arc, 13 3/4 in.; width, 3 3/8 in.; thickness, 1 1/2 in. This shoe has five inserts, 1 in. wide by 2 in. long, running crosswise. Shoe No. 336 is similar to Shoe No. 333 and bears the same marking.

Shoe No. 339 was designated by the committee as a plain cast-iron shoe, and was received from the Pennsylvania. The dimensions of the shoe when it was received at the laboratory were: Length on arc, 14 in.; width, 3 3/8 in.; thickness, 1 1/2 in. This shoe has no insert. It is reinforced with a steel back. Shoe No. 340 is similar to Shoe No. 339 and bears the same marking.

Shoe No. 345 was designated by the committee as a Spear-Miller shoe, and was received from the Chicago, Burlington & Quincy. The dimensions of the shoe when it was received at the laboratory were: Length on arc, 13 1/2 in.; width, 3 3/8 in.; thickness, 1 3/4 in. The shoe has two V-shaped inserts. It is reinforced with a steel back. Shoe No. 346 is similar to Shoe No. 345 and bears the same marking.

Shoe No. 351 was designated by the committee as a National type, and was received from the Chicago, Milwaukee & St. Paul. The dimensions of the shoe when it was received at the laboratory were: Length, on arc, 14 in.; width, 3 3/4 in.; thickness, 1 5/8 in. This shoe has chilled ends and is reinforced with a steel back. Shoe No. 352 is similar to Shoe No. 351.

Shoe No. 357 was designated by the committee as a Diamond S, Christie type. It is also known as the half-flange type, having a flange of 2 1/2 in. at each end of the shoe. It was received from the Southern Pacific. The dimensions of the shoe when it was received at the laboratory were: Length on arc, 14 in.; width, 4 in.; thickness, 1 1/4 in. The insert of this shoe is composed of a bundle of expanded metal, covering the entire face of the shoe. The shoe is reinforced with a steel back. Shoe No. 358 is similar to Shoe No. 357 and bears the same marking.

Shoe No. 367 was designated by the committee as a U shoe. It was received from the New York Central Lines. The dimensions of the shoe when it was received at the laboratory were: Length on arc, 15 3/4 in.; width, 3 3/4 in. and thickness, 1 5/8 in. The ends of the shoe are tapered and chilled. The shoe is reinforced with a steel back. Shoe No. 368 is similar to Shoe No. 367 and bears the same marking.

Shoe No. 376 was designated by the committee as a Pittsburgh shoe. It was received from the Pennsylvania. The dimensions of the shoe when it was received at the laboratory were: Length on arc, 14 in.; width, 3 3/8 in.; thickness, 1 3/8 in. This shoe is made up of a pressed back, 1/8 of an in. thick, completely filled with a composition filler. Shoe No. 377 is the same as Shoe No. 376.

**Schedule of Test.**—So far as practicable, each shoe was tested upon a steel-tired wheel under the following brake-shoe pressures: 12,000, 14,000, 16,000, 18,000 and 20,000 lbs., the initial speed of the machine being in each case 80 m. p. h. At each of the above pressures nine stops were made.

**Method of Testing.**—In anticipation of a test, the shoe was given a number of applications until a full bearing surface was obtained, after which it was accurately weighed upon a pair of scales. The shoes were first tested at a pressure of 12,000 lbs., after which the pressure was increased by increments of 2,000 lbs. until a pressure of 20,000 lbs. was reached, or until the shoe broke or became unserviceable.

The loss in weight of the shoe was obtained by weighing the shoe after each three applications, thus giving a check upon the loss for each pressure. During the nine applications at each pressure, three cards were taken from which the coefficient of friction was obtained. It will be seen that some of the shoes failed before the pressure of 18,000 and 20,000 lbs. had been reached.

Between each application the shoe was cooled by a blast of air until the temperature was reduced to such an extent that the observer could bear his hand upon the shoe. This required from twenty-two to twenty-eight minutes between each application.

**Results Obtained.**—Fig. 1 gives the results obtained at a brake-shoe pressure of 16,000 lbs. Col. I of this table gives the number of the brake shoe; Col. II, the designation of the shoe; Col. III, the road on which it is standard; Col. IV, the coefficient of friction of shoe; Col. V, the average coefficient of friction of the two shoes of the same kind; Col. VI, the loss for each

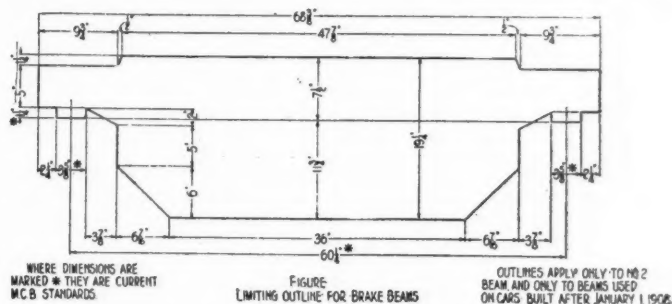


Fig. 4—Limiting Outline for Brake Beams.

100,000,000 ft.-lbs. of work done for each shoe; Col. VII, the average loss per 100,000,000 ft.-lbs. of work done for the two shoes of each kind.

Fig. 2 gives results obtained at 20,000 lbs. pressure.

Fig. 3 gives the approximate distance per stop in feet as obtained from the three cards taken at each pressure for the two shoes of each kind. Col. I of this table gives the number of the brake shoe; Col. II, the designation of the shoe; Col. III, the road on which it is standard; Col. IV, the approximate distance in feet during the stop at a pressure of 12,000 lbs.; Col. V, the approximate distance in feet during the stop at a pressure of 14,000 lbs.; Col. VI, the approximate distance in feet during the stop at a pressure of 16,000 lbs.; Col. VII, the approximate distance in feet during the stop at a pressure of 18,000 lbs.; Col. VIII, the approximate distance in feet during the stop at a pressure of 20,000 lbs.

**Notes Concerning Tests.**—Shoe No. 334 was selected as the second Congdon shoe for test. This shoe broke in two at the second stop at 12,000 lbs. pressure and no record was made. Shoe 335 of this same type also broke in two at the same pressure during the first stop.

All of the shoes, with the exception of the two mentioned above, stood nine stops at each of the pressures, 12,000, 14,000 and 16,000 lbs. All of these shoes, also, with the exceptions of Nos. 352 and 368, withstood nine stops at 18,000 lbs. pressure, but these two broke at the first stop at 18,000 lbs. pressure. No record, therefore, was obtained for these shoes at this pressure.

Shoe No. 345 broke at the ninth stop at 18,000 lbs. pressure. Shoe No. 336 broke after the third stop at 20,000 lbs. pressure, and the results from this shoe are based on the three stops. Shoe No. 333 and Shoe No. 351 stood only seven stops at 20,000 lbs., and the results from these shoes at this pressure are based on these stops. All of the other shoes tested and not

mentioned above, namely, Nos. 339, 340, 346, 357, 358, 367, 376 and 377, stood nine stops at 20,000 lbs. pressure.

The coefficient of friction of all but two kinds of shoes tested decreased as the pressure increased, the two exceptions being the plain cast-iron shoe and the National shoe. This is no doubt due to the fact that the composition of the outside layer of the shoe is not of the same texture as the inner layer, or that the heating and cooling of the shoe changed the material in such a way as to affect the frictional qualities. Also, the loss due to wear is increased as the pressure is increased in all but three kinds of shoes. These are the plain cast-iron, the National and the U shoe. Two of these kinds of shoes are the ones which showed the inconsistency in the coefficient of friction.

In order to check these seeming inconsistencies, either in the wear or frictional qualities, three shoes, one of each kind mentioned above, were again tested at 12,000 lbs. pressure after the tests at 18,000 lbs. pressure had been conducted. In each case the seeming inconsistency practically disappeared, showing that tests of the outside layer of a shoe will not in all cases give similar results to tests of the inner material.

The coefficient of friction for all shoes, except one, are similar, there being less than two per cent. variation in any two sets of shoes. The one exception is the "Pittsburgh" shoe, which is a composition shoe, and gave practically twice the coefficient of friction obtained from any of the other shoes.

The wear is not uniform for the different makes of shoes, it varying from about 1.5 to over 5 lbs. per 100,000,000 ft.-lbs. of work done at 12,000 lbs. pressure and from about 3.5 to over 12 lbs. at 20,000 lbs. pressure. The loss is not much increased until a pressure of 18,000 or 20,000 lbs. is reached.

The distance per stop is about the same for all shoes but one, this shoe being the "Pittsburgh" shoe, which gave the highest coefficient of friction. Three of the shoes tested stopped the wheel in a less distance at 18,000 lbs. than at 20,000 lbs., and three of the other four shoes gave almost the same results at 18,000 as at 20,000 lbs. The only shoe that showed much advantage at 20,000 lbs. over that at 18,000 lbs. was the "Spear-Miller." This shoe became very hot and gave off a flame three or four feet long resembling a gas flame during the stop at 20,000 lbs. pressure.

#### BRAKE BEAMS.

*Changes in Drawing of Brake Head.*—The committee desires to recommend certain changes in the drawing of the standard brake head as shown on Sheet M. C. B. 17.

1. The dimensions of the upper-hanger hole have been made the same as the dimensions of the lower-hanger hole, to permit the use of the 1-in. hanger. This change was omitted from the drawing last year through error.

2. The inclination of  $1\frac{3}{16}$  in. in  $6\frac{1}{8}$  in., as shown on the side elevation of the head on Sheet M. C. B. 17, is correct for the brake beam hung 14 in. above the rail, but is not correct for the standard 13-in. hanging for inside-hung beams. The drawing has been corrected to show an inclination of  $1\frac{1}{2}$  in. in 6 in., to correspond to the 13-in. hanging, and all the vertical dimensions have been made to read from a line drawn through the center of the bottom-hanger hole and the center of the wheel. The contour of the head has not been changed in doing this.

3. The ribs bracing the under side of the lower shoe-bearing lug have been removed from the drawing, as these ribs are not actually being used on the heads to-day.

4. Sheet M. C. B. 17 shows a  $\frac{5}{8}$ -in. radii at the ends of the shoe-bearing lugs, and the committee believes this only results in less bearing area and is of no value, and accordingly the drawing has been changed to show a  $\frac{1}{8}$ -in. radius at this point and the side of the lug has been slightly tapered.

The committee recommends the adoption of these changes, which we believe to be improvements in the design of the head, without affecting its interchangeability with heads and shoes now in service.

*Review of Recommendations 4 and 5 of the 1910 Report.*—Among the several recommendations made by your committee at last year's convention there were two, numbers 4 and 5, which were rejected on the letter ballot. They are as follows:

"That all No. 2 beams used on cars built after January 1, 1908, shall be of such dimensions that all parts of the beam will lie within the outline shown in Fig. 10 of this report, and that this outline be shown among the standard drawings.

"That on page 591 of the Proceedings for 1909, the seventh paragraph, relating to beam No. 2, be changed to read: 'Beam No. 2 must be used on cars of more than 35,000 pounds light weight, and it may be used on cars of 35,000 light weight or less.'"

For the purpose of ascertaining the reason for the objection to these two recommendations, the committee early issued to the membership of the Association a circular of inquiry, asking the roads which voted against these propositions to state

their reasons to the committee. The purpose of this procedure was to secure for the committee such information as would permit it to modify the recommendations so as to make them acceptable to the objecting roads. A meager response, only, was returned.

Some of the suggestions received in reply to this circular are conflicting, but they have all been combined, as far as possible, to form a new diagram as is shown in Fig. 4.

The principal points raised related:

1. To the distance from the face of the brake head to the back of the beam, which has been changed from  $5\frac{1}{2}$  in. to 5 in.

2. With steel or steel-tired wheels, which may be reduced to 30 in. in diameter, there is danger with a deep beam of having the fulcrum strike the axle.

3. The location of the diagonal lines limiting the tension members of the beam has been changed to avoid confliction with some beams which are now in service.

The diagram shown in Fig. 4 is submitted for the consideration of the members with the same recommendation with which the diagram was submitted last year.

Having presented the discussion so far as it could be developed, your committee would resubmit for discussion recommendations 4 and 5 as above given, with the request that they be so modified at the convention as to make them acceptable to the members.

The report is signed by:—W. F. M. Goss (Uni. of Ill.), chairman; C. D. Young (Penn.), and R. B. Kendig (N. Y. C.)

The report was presented by C. B. Young in absence of Prof. Goss.

#### DISCUSSION ON BRAKE SHOE EQUIPMENT.

The President: The recommendations of the committee in the first part of this report, which is the part that we will consider first, are, in substance, that some further work be undertaken by the association for the purpose of connecting the results obtained under high brake shoe pressures with those upon which the association's specifications are based. Also, that in the specifications as presented in the report of 1910, paragraphs "c" and "f," be changed to read "steel or steel-tired wheel" instead of "steel-tired wheel."

C. E. Fuller (U. P.): Mr. President, I move that the recommendation of the committee, reading: "That some further work be undertaken by the Association for the purpose of connecting the results obtained under high brake-shoe pressures with those upon which the Association's specifications are based," be referred to the in-coming executive committee.

I also move that the secretary be instructed to change the reading as presented in the report of 1910, paragraphs "c" and "f," to "steel or steel-tired wheel" instead of "steel-tired wheel."

The motion was seconded.

T. L. Burton (C. of N. J.): Before the motion is put, Mr. President, I would like to inquire as to the operation of this testing machine. The committee states that the shoes were tested under varying pressures, the initial speed of the machine being, in each case, 80 m. p. h., and that at each of these pressures nine stops were made. The resulting coefficient is tabulated later on in the report. Were any provisions made in those tests for varying the axle weight or the wheel weight of the testing machine so that the preferred breaking power remained practically constant?

My reason for making this inquiry is that in raising the brake-shoe pressure from 12,000 to 20,000 lbs., if the wheel weight remains constant it will increase the percentage of the braking power about twenty-three per cent. Naturally, all other things being the same, the stop would be materially shortened and the coefficient friction would naturally run higher than if the wheel weight were increased. So that 20,000 lbs. pressure would represent the same braking power that 12,000 lbs. would. In other words, in putting the pressure up you introduce the very important factor of the time element on the coefficient of friction. It is my understanding that the M. C. B. testing machine did not provide for varying the wheel weight, unless it has been done recently.

Mr. Young: I can only say that the machine is so constructed that it has a falling weight which gives the shoe pressure. It gives the wear of the shoe with any pressure upon the wheel at a corresponding speed. The inertia of the machine is the same throughout any of the varying pressures, whether 12,000, 16,000, 18,000 or 20,000 lbs.

Mr. Burton: Then is it not true that the coefficient of friction shown by the high pressures is materially higher than one would expect in service with the lower percentage



of braking power? The point I am endeavoring to get at is that I want to emphasize the ill-effect that we get from these tremendously high shoe pressures due to the loss of the coefficient friction.

Mr. Young: I believe that the question raised by Mr. Burton ought to be referred to the committee, because I do not feel that I am fully qualified to answer. My judgment would be that the coefficient would be about the same for each of these pressures, regardless of the percentage of braking power. There may be some increase in the coefficient with the testing machine as it stands now, but if so it is very slight.

Mr. Fuller: I will incorporate the suggestion made by Mr. Young in my motion that this be referred back to the committee. It is a very important point, and one that I think should have full and deliberate consideration.

The motion was carried. The second part of the report was then considered.

C. D. Young: The recommendations for brake beams are the same as for last year as regards paragraphs 4 and 5, with the substitution of the diagram shown in Fig. 4 for old diagram 10.

R. L. Kleine (Penn.): Paragraph 4 under *Brake Beams* states that the drawing has been changed to show a  $\frac{1}{4}$ -in. radius at this point and the side of the lug has been slightly tapered. The illustration shows that connection to be  $1/16$  of an in.

C. D. Young: That is a mistake.

The President: Mr. Burton, Professor Endsley has just come in the room, and perhaps he can answer the question that you put to Mr. Young a moment ago.

Mr. Burton: The question that I raised, Professor Endsley, was in relation to increasing the brake shoe pressure without increasing the wheel load of the brake shoe machine so as to maintain a constant percentage of coefficient friction, and I raised the point whether or not we would have the right to assume that the coefficients shown under different pressures are due solely to the variations in the pressures, or whether they are due in part to a variation in the braking power. That is, if we put on the pressure from 12,000 to 20,000 lbs., why it is increased 23 per cent., about, and the stops naturally will have to be shortened and the time element is shortened.

T. E. Endsley (Purdue Univ.): Well, the only thing we can do is to use the one weight of wheel. That is equivalent to a car weighing 145,000 lbs. with 12 wheels under it. There was no difference made in choosing the different per cents. All that was done was choosing different brake shoe pressures upon a given car, like you would take a Pullman car and decide whether you were going to use 12,000 lbs. or 20,000 lbs. brake-shoe pressure. Of course, there would be some difference if you increased the rotary energy of your wheel. If you increased the rotary energy of your wheel it would decrease the coefficient friction—that is, on some brake shoes, and on other brake shoes it would increase it, because some are a little larger hot and cold, and others smaller hot and cold. But here in the test referred to in this report all that was done was to use what was equivalent to a Pullman twelve-wheel car.

The President: Referring again to part 2 of the report, the paragraphs under review of recommendations 4 and 5 contain the statement of the committee that these recommendations were defeated last year by letter ballot, and they would like to have it discussed, if possible, this year. Mr. Seley, can you give us any light on the matter?

C. A. Seley (C. R. I. & P.): I only recall that I did object to the diagrams as presented last year for some minor change, but I cannot see that I object to it at all now, and therefore I move that the recommendation of the committee be adopted and reported to the membership for letter ballot.

The motion was carried.

A railway which was constructed years ago, connecting Llanymynech-Westbury, England, with Shrewsbury, with a total length of 28 miles, has been reopened after having been closed, by order of the Board of Trade, for 31 years. Twenty years of almost continuous running at a loss had put the road in a bad state of repair. Now it is run more economically and is working in connection with the main line railways with which it connects. Its chief advantage will be in carrying stone from Wales to Shrewsbury and the Midland.

#### M. C. B. RECEPTION.

The annual reception by the officers of the M. C. B. Association was given in the Blenheim Exchange, of the Marlborough-Blenheim hotel, at 9.00 o'clock last night. Before the receiving line formed, the Cadets de Gascogne, in costume, gave a musical entertainment from the balcony. They are three men and one woman, and sang selections in both Italian and French. After the reception there was informal dancing. Refreshments were served in the ball room.

The committee in charge of the reception consisted of F. B. Ernst, Chairman; F. M. Nellis, L. B. Sherman, Ross F. Hayes, Charles A. Knill, George R. Carr, Harry S. Hammond, W. J. Walsh and E. E. Silk.

#### THIS AFTERNOON'S ENTERTAINMENT AT THE CASINO.

Miss Beatrice Herford, whose monologues are in a class by themselves, will give one of her entertainments at the Brighton Casino at 3 o'clock this afternoon. No one who has heard or read one of her delightful "take-offs" needs urging to go again. Admission will be by badge. The Casino is on the Boardwalk between the Traymore and the Marlborough-Blenheim.

#### OPERATION OF SUPERHEATER LOCOMOTIVES.

One of the characteristic results of the operation of superheater engines is the sense of security on the part of the engineer. This is manifested by the request to be assigned to these engines rather than to saturated engines. The superheated steam engine has enough reserve power to make up considerable lost time in an emergency; and under ordinary conditions it always has full steam pressure.

In starting out of the engine house, care should be taken, as on the saturated steam engine, to have the cylinder cocks open and to drain away all water resulting from condensation owing to the engine having stood still for a long period. In general it is not at all necessary to open the cylinder cocks on the roads, as is often the case with the saturated steam engine. With full boiler pressure, and as a result of the larger cylinder diameter gained with superheated steam engines, a little greater care is required in starting not to slip the drivers; an extremely light throttle is all that is necessary to start. On the road, however, a full throttle and a short cut-off cannot be too strongly advocated, as the beneficial results obtained in nearly every case where they have been used have proved. In starting, however, for a short time a full cut-off should be used, which will give full valve travel and thoroughly lubricate all surfaces in a manner to guard against trouble.

Arrangement of the superheater damper and its cylinder is such that the engineer can easily ascertain at any time whether the damper is working properly. The counterweight on the damper shaft is located on the right hand side of the smoke box and its movement is upward when the throttle is open, and downward when the throttle is closed plainly shows the way in which it is working. The firing of the superheater engine calls for the same general practice as the firing of the saturate engine, but the advantages of light and regular firing are greater because good firing means a higher fire-box temperature, an increase in the degree of superheat, or a higher temperature to the steam, and, therefore, a maximum coal economy, and the best all-around results.

A new speed recorder is being tried on the Prussian State Railway which records at the stations the speed of the train for every half-second, and, moreover, shows the intervals between trains which follow one another.

## Conventionalities.

Mrs. M. H. Coates, mother of Frank R. Coates, spent Saturday and Sunday at Atlantic City.

H. L. Ingersoll, assistant to the general manager of the New York Central, is expected to be in attendance at the convention today.

F. H. Greene, president of the Hale & Kilburn Company, was suddenly called away yesterday because of the death of his father at Toledo, Ohio.

W. C. Bower, the new purchasing agent of the New York Central and formerly assistant to President Brown, spent Sunday and Monday in Atlantic City.

Blake C. Howard, son of George C. Howard, is attending the convention with his father. Mr. Howard is a student of architecture at Washington University.

A. T. Hardin, assistant general manager of the New York Central, arrived yesterday afternoon, and is staying at the Marlborough-Blenheim. Mrs. Hardin is with him.

P. A. Martin, superintendent of equipment of the National Car Line Company, arrived Friday and registered at the Traymore. Mr. Martin is one of the M. C. B. workers.

George Barden is earning a reputation as a faithful attendant at the conventions, for, in truth, he has been with us for many years. Mrs. Barden is with him this year; they are at Young's Hotel.

G. W. Wildin, who busted the bat in the game on Saturday and had one of his fingers badly bruised near the close of the game, spent a quiet Sunday getting rested up. The finger is still badly swollen.

W. P. Richardson, mechanical engineer of the Pittsburgh & Lake Erie, came in Sunday afternoon and spent most of the night on the boardwalk. Business is so lively he had to return home last night.

Norman C. Naylor, of the Railway Steel-Spring Company, is attending the convention this year for the first time, notwithstanding the fact that Mr. Naylor has been in the service of the company for many years.

C. E. Mead arrived yesterday morning from Niagara Falls, and expects to remain until the close of the convention. Mr. Mead is making his headquarters at the Marlborough-Blenheim, where the family tepee is pitched.

James S. Stevenson, general manager of Berry Brothers, is attending his first M. M. and M. C. B. convention. His bodyguard consists of D. W. H. Moreland, Walter F. Wariner and H. P. Stephenson.

W. W. Melchet is attending this meeting for the Massachusetts Mohair Plush Company. Mr. Melchet succeeds Mr. Seabury, who will be remembered as one of the active committeemen at past conventions.

I. S. Downing, master car builder of the Lake Shore, is still walking with a heavy cane and limping slightly, owing to an injury in Saturday's ball game, when O'Brian landed on top of him in putting him out at second.

J. J. Hennessey, master car builder of the Chicago, Milwaukee & St. Paul, arrived yesterday and is stopping at the Chalfonte. With Hennessey, Schroyer and Brazier on the job we need have no fear of dull or commonplace meetings.

C. A. Schoyer, superintendent car department of the Chicago & North Western, is one of those who are using their good efforts to get the younger men interested in the work of the association. When he was nominated for treasurer yesterday

he courteously withdrew in their favor, at the same time remarking that the job offered no temptation to him since the association in its life of 45 years had only succeeded in accumulating \$1,100.

The white flannel suit, white shoes and white socks (oh, everybody's seen 'em) worn by the exquisite C. J. Donahue, of the American Locomotive Company, have certainly contributed their share toward the brightness of the assembly at the Marlborough-Blenheim.

R. L. Doolittle, of the Atlanta, Birmingham & Atlantic, whose title was recently changed from master mechanic to superintendent motive power, is stopping at Young's. He is probably the tallest railway man in attendance at the conventions.

Frank Reagan, recently appointed shop superintendent of the Delaware, Lackawanna & Western, is one of the younger men who were brought up and developed in the Lake Shore. He is in attendance at the convention and is stopping at the Belleville.

I. B. Thomas, formerly master mechanic of the Pennsylvania at Altoona and recently appointed superintendent motive power of the Erie division of the Pennsylvania and the Northern Central, arrived yesterday, and is busy receiving congratulations on his promotion.

Mr. and Mrs. C. W. Sherman and Mr. and Mrs. G. P. Warner, all Buffalonians, are now entrenched in the convention festivities, and will stay until the close. Mr. and Mrs. Sherman are at Haddon Hall, and Mr. and Mrs. Warner are at the Chalfonte.

C. H. Cory, an honorary member of the M. C. B. Association and formerly superintendent motive power of the Cincinnati, Hamilton & Dayton, is at the Dennis. Mr. Cory is one of the older members and his friends are glad to see him looking so well.

William McWood, president of the association during 1888, 1889 and 1890, was greeted enthusiastically when introduced yesterday as the oldest living president. The conventions at which he presided were held at Alexandria Bay, Saratoga and Old Point Comfort.

H. C. Martin, freight traffic manager of the Grand Trunk, accompanied by their guest, Miss Shallmiller, of New York, are in Atlantic City attending the conventions and are stopping at the Chalfonte. The trip to Atlantic City is in celebration of Mr. and Mrs. Martin's wedding anniversary.

President Curtis was delighted with the attendance at the meeting yesterday and at the interest which the members showed in the subjects under discussion. He has been watching the meeting from the platform for the past two or three years and says that the improvement in interest is very marked from year to year, and especially so this year.

Last week the M. M. Association had some difficulty in finding a representative of the Traveling Engineers' Association. The M. C. B. Association is more fortunate, for W. O. Thompson, master car builder of the New York Central at Buffalo, who is secretary of the Traveling Engineers' Association and was one of its founders, arrived yesterday.

What happened to Mayor Stoy? He didn't show up yesterday morning to open the M. C. B. meeting. Further, following the notice in *The Daily*, the badge given to the Mayor by the executive committee was handed to Chairman Ostby, of the enrollment committee, bright and early yesterday morning by someone who had found the decoration. The question is, "Did the Mayor have his police card with him Sunday night?"

Many will welcome the attendance of J. J. Ryan, superintendent of motive power of the Harriman Lines of Texas.



a member of both associations, who is stopping at the Marlborough-Blenheim. Mr. Ryan has seen 34 years of continuous service in the motive power and car departments. H. J. Small, general superintendent of motive power of the Southern Pacific has seen upwards of 30 years of continuous service, and J. R. Cade, master car builder of the Galveston, Harrisburg & San Antonio, has served continuously 37 years.

C. S. Rea, of the Ralston Steel Car Company, met an old friend here yesterday in Doctor Irvin J. Morgan, organist and choirmaster of Trinity Episcopal Church, of Pittsburgh. Dr. Morgan is here to give a concert at St. James' Church, North Carolina and Pacific avenues, this evening at 8 o'clock. Dr. Morgan is a famous musician, having been organist at Westminster Abbey before coming to this country. Admission to the concert will be free, and perhaps some attending the conventions may choose to make it a prelude to tonight's ball.

J. Will Johnson and S. T. Fulton met on the pier yesterday for the first time in some years. They used to ride on the same train every once in a while down on the Frisco Lines; but they didn't see much of each other en route, for they were at different ends of the train. Johnson, on those trips, was at the throttle of the engine pulling the train on which was Vice-President B. L. Winchell's car, while Fulton was back in the car with Mr. Winchell, who was his chief. Both are now taking money away from the railways by selling them supplies instead of by drawing salaries.

S. T. Fulton, who is attending the convention, formerly was assistant to the president of the Rock Island Lines when B. L. Winchell was their president. He went with the Railway Steel-Spring Company a little over a year ago. Being new to the supply business, he did not attend last year's conventions. This is therefore his first visit. Mr. Fulton was associated with Mr. Winchell back in the days when the latter was president of the Kansas City, Fort Scott & Memphis. He then left railway work and engaged in the coal business. So this is not the first time he has broken from transportation to commercial business. It was Mr. Winchell who later tempted him back into railway service.

Secretary Taylor read the following letter in the convention yesterday:

"June 7, 1911.

"For the first time in many years I shall not be at the convention. Continued bad health has compelled me to make my residence in California, where I hope to partially regain my health, at least. This is a beautiful section of the country. There is everything here to please the eye, but I wish I could be at Atlantic City with you. Wishing the association at its convention all possible success, I am,

"Yours sincerely,

(Signed) "W. E. FOWLER,

"Past President of the Association."

Warren J. Lynch, fourth vice-president of the American Steel Foundries, is attending the conventions for the first time. He took his present position only a short time ago, having previously been passenger traffic manager of the New York Central Lines West of Buffalo. It is not an uncommon thing for a man to go from the operative department of a railway into the supply business. It is a very uncommon thing for one to go as Mr. Lynch has from the traffic department into the supply business. But Mr. Lynch was a passenger man who did not confine his study and observation to the traffic department. There was nothing about a railway that did not interest him, so the change from selling passenger transportation to selling supplies is not proving violent.

Charles A. Knill, who was Chairman of the base ball committee, is gradually recovering from the effects of the exertions necessary to pull off last Saturday's game. Mr. Knill deserves a lot of credit for the game's success. It took a great deal of work,

both before and since the beginning of the conventions, to make and carry out the plans for it; and the job was mighty well done.

In conclusion, The Daily apologizes to the base ball Chairman for calling him "Charles M. Knill" in its account of the game. It takes a jolly good fellow not to be irritated by recognition of a good job in the form of a wrong statement of his name, and "Charley" Knill is a good fellow—as every one attending these conventions knows.

One of the familiar faces in the eastern base ball team which did not appear among the pictures in *The Daily* on Monday was that of Leonard J. Hibbard. Hibbard has played in every game at these conventions for years, was chairman of the base ball committee last year and was one of the star performers on the eastern team this year, making the only two-base hit for his side. Because several of his friends have called attention to his absence from the pictorial array, the base ball editor of *The Daily* has been laid off until next June. Certain other players were not included, some from lack of space, and others, like Flemming and Jones, because they got into the game after our photographer had exhausted his films and legs. If we ever try a thing like that again, we shall have to get our photographer more films and better legs.

H. F. Wardwell, superintendent power and equipment of the Chicago & Western Indiana, is attending the convention for the first time. He is accompanied by Mrs. Wardwell, and they are at the Traymore. Mr. Wardwell was formerly with the Hicks Locomotive & Car Works. Prior to that he was for some years chief clerk to President F. A. Delano, of the Wabash, and in that capacity he set a good example to numerous other chief clerks to executive officers in his ever considerate and tactful treatment of visitors to his chief's office, in consequence of which he made numerous friends for himself and helped enhance the great popularity of his chief. Mr. Wardwell began his railway career as a machinist's apprentice on the Burlington, and while he was out of the mechanical department some time, his main interest has always been in it.

The name of J. W. Marden (B. & M.) has been proposed for life membership in the M. C. B. Association. The proposal has been approved by the executive committee, and his name will be posted for voting on Wednesday.

J. W. Fleming, who has been a member of the association since 1881, has also been proposed for life membership. He was chairman of the passenger car department of the Chesapeake & Ohio for many years; he was injured and has been unable to do any work since. This proposal also has been approved by the executive committee, and his name will also be posted for voting on Wednesday.

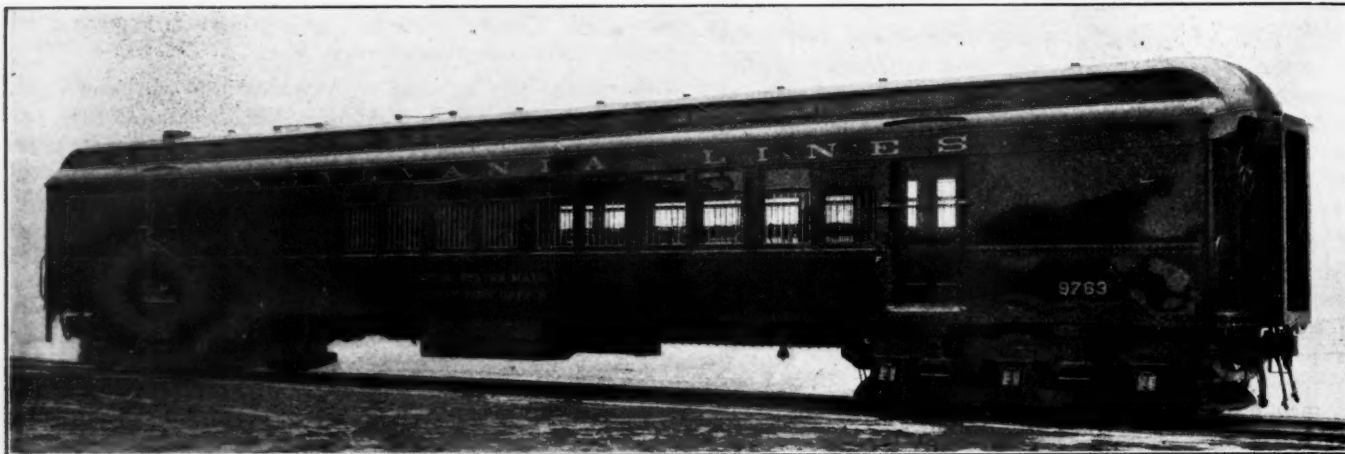
Prof. C. E. Schmidt, of the University of Illinois, has been proposed for associate membership. As required by the constitution, action on this proposal will be taken at next year's meeting. Prof. Schmidt was graduated from Stevens Institute of Technology in 1895, and for three years thereafter was engaged in practical work. This was followed by five years as an instructor in the University of Illinois, and in 1903 he resigned to enter into practical work again. For three years he was engaged with various phases of steam engine design and construction. In September, 1910, he was appointed professor of railway engineering in the University of Illinois.

The Hungarian State Railways are under the direction of the Minister of Commerce, who is overwhelmed with other duties. The recent death of this Minister, Karl von Hieronymi, has been the occasion of a movement to divide the duties between a Commerce Minister and a Transportation Minister, which latter will have not only the railways, but navigation, telegraphs, post-offices, telephones, highways and river and harbor improvements in his charge.

**STEEL POSTAL CARS FOR THE PENNSYLVANIA.**

The Pennsylvania System has recently received from the American Car and Foundry Company, New York, seven 70-ft. steel postal cars. These cars were built at the Berwick Shops from the railway company's designs. The cars are equipped

$\frac{1}{8}$ -in. cover plates. The deck plates are  $\frac{1}{8}$ -in. pressed steel. The cars are sheathed with  $\frac{1}{8}$ -in. steel plates and lined with 1-16-in. plate secured to light angles which are riveted to the side frame. The roof sheets consist of .080-in. steel plates with Nos. 14 and 16 gage sheets at ends. The headlining is made up of aluminum plates 1-16-in. in thickness. The floor sheets



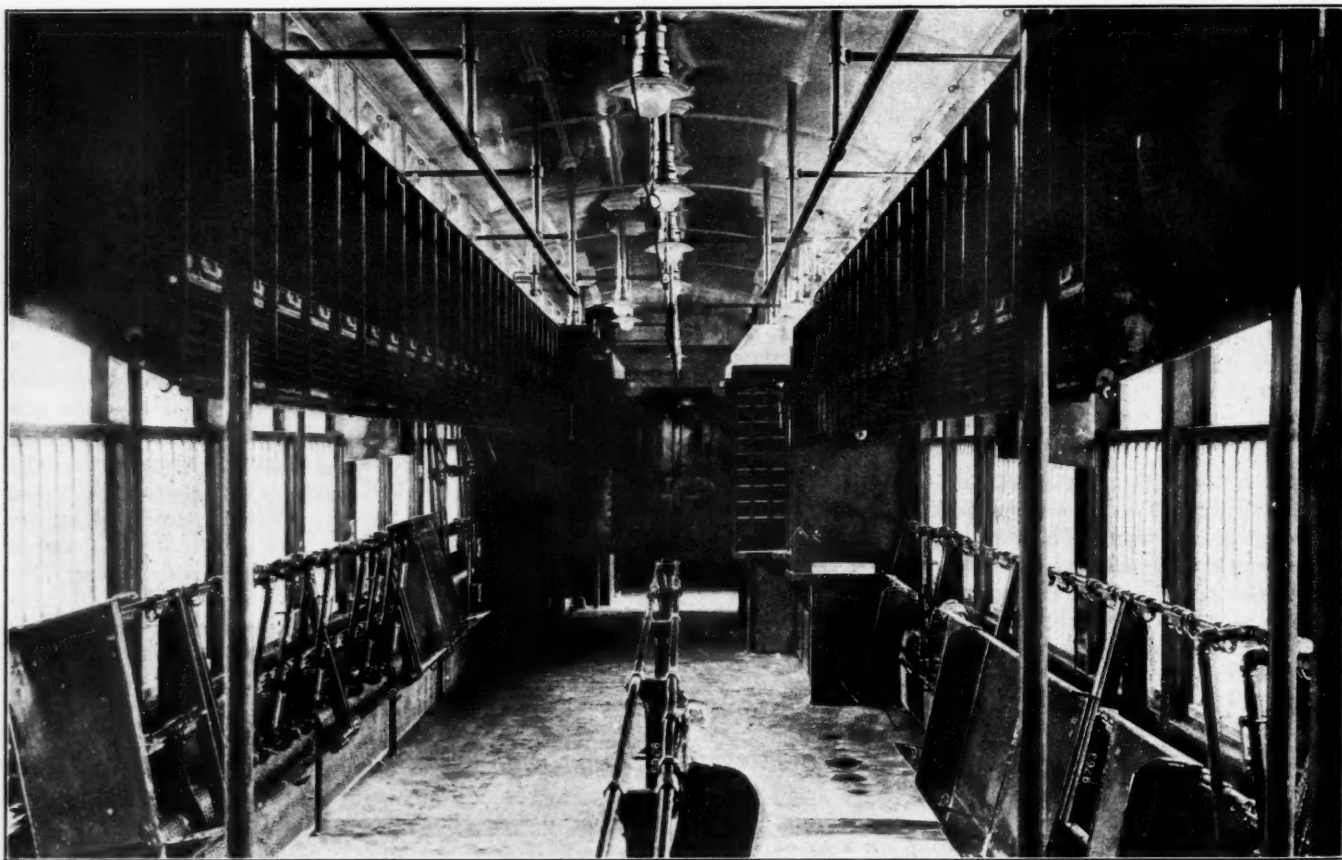
70-Ft. Postal Car; Pennsylvania Railroad.

with six-wheel steel trucks and weigh 124,700 lbs. The center sills consist of two 18-in. channels weighing 44.2 lbs. per foot, with  $\frac{1}{2}$ -in. top and bottom cover plates. The side sills are 5-in. x  $3\frac{1}{2}$ -in. x  $\frac{9}{16}$ -in. angles. The end castings are cast steel. Cantilevers of  $\frac{3}{8}$ -in. pressed steel plates extending from center sill channel to side sill angle and are secured to the center sills by  $\frac{3}{8}$ -in. steel tie plates. The side posts are  $\frac{1}{8}$ -in. pressed steel plates extending from side sill angle to deck sill. The corner posts are built up of Z-bars and cover plates. The end door posts are 12-in. channels weighing 31.5 lbs. per foot, with

are corrugated iron .060 in. thick, having corrugations  $\frac{3}{4}$ -in. deep, with  $2\frac{1}{2}$ -in. pitch and are covered with monolith cement  $1\frac{1}{2}$ -in. deep.

The sides and roof of car are insulated by means of 3-16-in. ceillinite glued to the inside lining and headlining sheets.

The paper cases, drop tables, etc., are built up from 1-16-in. steel plates reinforced with light steel angles. Westinghouse air brake schedule P.M. 1612 is used with an automatic slack adjuster and air signals. The heating equipment is the Chicago Car Heating Company's vapor system. The cars are lighted by



All Steel Postal Car; Pennsylvania Railroad.



electricity generated by the Gould axle system, and are equipped with sixteen Tungsten lamps of forty candle power. The Pitt coupler with centering device is used on these cars in connection with Westinghouse friction draft gear.

#### THE OIL FURNACE IN SMITH SHOP AND FORGE.

In the development of railway shops, the blacksmith department frequently is not fully considered. In the days of hand forging from open fires this was possibly excusable, as the best heating arrangements were crude and did not then, as now, control the output of the shop. However, as the forging machines, bolt headers and bulldozers were developed, the heating facilities became the governing factor and called for consideration more careful. The coke furnace was the first advance made in this development, and in so far as the quality of the heat was concerned, it was very satisfactory, a clean and quick heat being the most important requisite. As the machine possibilities became better understood this method was found too slow, simply because it required too much time to start the day's work and too much attention for cleaning and rebuilding during the day, all of which resulted in high priced machines standing idle much of the time. These conditions, coupled with a desire to rid the shop of the objectionable gases from coke fires and to put to better use the valuable floor space occupied by coke bins, were the direct causes resulting in the development of gas furnaces for those located in or near gas fields and oil furnaces for the less fortunate majority.

It was a very simple matter to burn oil if compressed air was available; the university adopted theory of oil combustion was then based upon a purely mechanical operation of atomizing the fluid. This, in practice, consisted of simply breaking up the oil with the air pressure into very minute particles or globules, so that the maximum surface of the oil would be presented to the air supplied for combustion. The apparent simplicity of the operation resulted in a very general use of oil as a fuel and the development of a great variety of so-called atomizing burners, shooting the oil directly into the furnace. Unfortunately practice did not sustain the theory. Perfect atomization was impossible and unburned oil reached the material being heated, considerable of it even leaving the furnace with the products of combustion. Furthermore, the heat absorbed in the early stages of breaking down the oil to the gases was not in the natural process of combustion returned, but was carried from the furnace with the products of incomplete combustion and wasted. The unburned oil in the furnace was injurious both to material and dies and the slowness of combustion, coupled with the high velocity of the operation, caused a serious loss of heat through the stacks. Fire boxes or combustion chambers were not satisfactory on account of the destructive cutting effect of the high pressure upon the furnace linings, and furnaces large enough to complete a combustion cycle, enabling the iron or steel to absorb heat before it left the furnace, were too large for convenience.

Steam was frequently used instead of compressed air and it is interesting to note that the claim was often made that the use of steam enriched the fuel on account of the hydrogen it contained; in fact, the same argument is occasionally heard to-day. This system, while producing a furnace far superior to the old type, was not equal to the demand of the machines, was expensive on account of the high cost of compressed air and was a nerve-racker on account of the noise produced.

Finally the use of low pressure burners was inaugurated by the invention of a system using a double blast and requiring but a few ounces of fan pressure. This process first gassified the fuel by partial combustion and with a

secondary air supply completed the operation. On account of the low pressure, the combustion chamber was found practical and the resultant heat of combustion was made available immediately upon entering the furnace proper. This, coupled with the low velocity and softness of the flame, reduced the loss in products of combustion to a minimum and made small furnaces possible. After years of development we now have oil furnaces specially designed for certain classes of work and the heating facilities of our railway smith shops have reached a high state of efficiency, many of them having installed small, clean furnaces which have brought up the capacity of the forging department to equal or exceed the machine shop requirements.

This condition put the output directly up to the forging machine operator and has developed some exceptionally good work. For instance, daily outputs of 3,600 1-in., 6,000  $\frac{3}{4}$ -in., 7,000  $\frac{5}{8}$ -in. or 8,000  $\frac{1}{2}$ -in. square head car bolts are obtained in regular practice from one machine and a small furnace of this type. Forty thousand button head 3-in. by  $\frac{3}{4}$ -in. rivets, or a corresponding output of square head car bolts, is the day's output from one automatic machine where this equipment is in use. In heavy hammer work, heating in a 5 ft. by 8 ft. two-door furnace, 4,700 lbs. of finished shape work, such as main and side rods, transmission bars, eccentric rods, etc., or 64 finished slabs of 300 lbs. each piled from scrap in 10 hours, is a day's work in one of the larger shops. Another shop is turning out 135 engine truck cradle hangers weighing 23 lbs. each, as a day's work, with one machine and furnace. Petroleum is the natural fuel for the general line of furnaces required in railway shops. It has a high calorific value and intensity, is easily handled and is abundant in nature. Properly burned, it makes a clean, soft and quick heat.

#### ARBITRATION COMMITTEE.

There will be a meeting of the committee on arbitration this afternoon at 4 o'clock in the Greek temple. Any members of the association who have suggestions to make are asked to come to this meeting and make them, so that the matter may be threshed out there rather than on the floor of the convention.

The presentation of the committee's report has been postponed from Tuesday to Wednesday.

#### FOREIGN RAILWAY NOTES.

An Imperial Chinese decree orders a survey for the purpose of devising a system of railways to connect all parts of the Empire.

The Russian Council of Ministers has considered the general question of Siberian railways and favors the construction of the Semipalatinsk-Barnaul-Novo-Nikolaieffsk Railway at the expense of the treasury. At the present time in view of the applications made from the interested towns the council approves the construction of the Altaisk railways on a concessionary basis with the object of having them completed as soon as possible. This line is likewise of great economic importance to the region it will traverse.

#### M. C. B. REGISTRATION.

Acker, Chas. L., M. M., Toledo Terminal R. R., Lexington.  
Akans, George, M. M., Southern Ry., Traymore.  
Albers, J. C., Chief Mch. Eng., Phil. Elev. R. R., New Clarion.  
Alter, William, G. F. C. D., Central R. R. of N. J., Elberon.  
Barnum, Morgan K., G. S. M. P., Ill. Cent. R. R., Dennis.  
Barry, J. J., M. M., Norfolk & Western R. R., Iroquois.  
Bartlett, Henry, Gen. Mech. Supt., Boston & Maine R. R.  
Benson, E. A., M. S., Pullman Co., Traymore.  
Bentley, W. F., M. C. B., B. & O. R. R., Pennhurst.  
Borrowdale, J. M., S. C. D., Ill. Cent. R. R., Brighton.  
Bossinger, H. C., G. F., Ches. & Ohio Ry., Pennhurst.

- Butts, H. W., Master Car & Loc. Painter, N. Y. C. & H. R. R., Windsor.
- Bottomly, Edward S., Chief Joint Car Inspector, Monticello.
- Boyd, N. N., M. M., Southern Ry., Pennhurst.
- Carmer, J. R., G. F. P. B. & W. R. R., Haddon Hall.
- Carr, W. K., G. C. I., Norfolk & Western Ry., Traymore.
- Caton, S. W., Gen. Car Insp., Western Md. R. R., Monticello.
- Chaffie, F. W., Gen. Car Insp., N. Y. C. & H. R. R., Dennis.
- Corinth, A. B., Asst. S. M. P., A. C. L. R. R. Co., Dennis.
- Cox, W. N., Supt. Transp. & Mach., Wellborn.
- Craig, Andrew, Gen. Foreman, B. & N., Young's.
- Craig, James, Chief Draftsman, B. & N., Young's.
- Coutant, M. R., M. M., Ulster & Delaware R. R. Co., Shelburne.
- Cullinan, John, M. M., Central Indiana Ry., Arlington.
- Davis, G. G., Gen. For. C. Dept., C. C. C. & St. L., Dunlop.
- Davis, J. H., Elec. Engr., Balt. & Ohio R. R., Chalfonte.
- Demarest, T. W., S. M. P., Penna. Lines, Brighton.
- Dickinson, F. W., Bessemer & Lake Erie R. R., M. C. B., Monticello.
- Dunlap, W. H., M. M., Louisville & Nashville R. R., Seaside.
- Dyas, Edmund C., F. C. D., L. & N. R. R., American.
- Eberle, Wm. F., Gen. For., Penna. R. R., Chalfonte.
- Eckhart, Jno., Jr., F. C. R., Erie R. R., Renova.
- Endsley, Louis E., Prof. Ry. Mach. Eng., Purdue Univ., Chalfonte.
- Friese, N. L., G. F., Norfolk & West. Ry., Strand.
- Fryer, C. U., G. F. C. D., N. Y. O. & W. R. R., Chalfonte.
- Gilbert, F. M., M. E., N. Y. C. & H. R. R. R., Seaside.
- Gray, G. M., S. M. P., Bessemer & Lake Erie R. R., Traymore.
- Hall, W. H., Chf. Car Insp., C. R. R. of N. J., Wellsboro.
- Hamilton, Tabor, Cumberland Valley R. R., Strand.
- Hartman, F. B., Genl. Equip. Inspr., Southern Ry., Pennhurst.
- Hayes, A. C., G. C. F., N. Y. C. Lines, Pennhurst.
- Hammett, Philip M., S. M. P., Maine Central R. R., Brighton.
- Hills, H. S., M. M., Louisville & Atlantic R. R., Berkshire.
- Hindman, S. M., Gen. Car Insp., Penna. R. R., Chalfonte.
- Hogsett, J. W., Chf. Joint Car Insp., Rudolph.
- Horrigan, John, S. M. P., Elgin, Joilet & Eastern Ry., Traymore.
- Howson, G. N., M. M., Southern Ry., Chalfonte.
- Johnson, Frank, M. M., Southern Ry.
- Johnson, J. O., Foreman Car Rep., Southern Ry., Sterling.
- Kaderly, W. F., S. M. P., G. S. & F. Ry., Chalfonte.
- Keagy, Chas. O., Gen. For., Penna. R. R. Co., Chalfonte.
- Kearney, A., A. S. M. P., N. & W. Ry., Traymore.
- Kellogg, W. L., Supt. Motive Power, C. H. & D., Haddon Hall.
- Kinney, M. A., S. M. P., Hocking Valley, Traymore.
- Kinter, D. H., G. F. C. D., Monongahela R. R., Watkins.
- Larson, Gustave, M. C. B., C. St. P. M. & O. Ry., Dennis.
- LaRue, H., M. C. B., C. R. I. & P. Ry., Traymore.
- Lewis, Harvey L., For. Car Shop, Delaware & Hudson Co., Miller.
- McCully, B. N., F. C. D., New York, Phila. & Norfolk Ry., Haddon Hall.
- McDonald, H. M., S. C. S., Washington Run R. R., Galen Hall.
- McKinsey, C. R., G. C. I., Phila., Balt. & Wash. Ry., Elwood.
- McIlvaine, C. L., Asst. Eng. N. C. P., P. R. R. Chalfonte.
- Maloney, J. P., T. M., Albany & Hudson R. R., Chalfonte.
- Mandville, H., G. Q. C. D. (Pass. Cars), Penna. R. R. Co. Marden, J. W., Brighton.
- Meloy, H. C., Chief Electrician, L. S. & M. S. Ry., Traymore.
- Michael, J. B., Southern Ry. Co., Pennhurst.
- Miller, E. B., Gen. Car Insp., B. & O. R. R., Baltimore.
- Miller, E. T., Gen. Car Insp., B. & O. R. R., Young's.
- Miller, Wm., G. F. C., E. & W. Div., Erie R. R., Monticello.
- Mills, Wm., M. C. B., Algoma Central & Hudson Bay Ry. Co., Bothwell.
- Minick, Eli, G. F. C. R., Lehigh Valley R. R., Monticello.
- Morris, W. S., Past M. C. B., Marlborough-Blenheim.
- Munroe, J. T., G. F. C. R., Erie R. R., Chester Inn.
- Murrian, W. S., S. M. P., Southern Ry., Shelburne.
- O'Donnell, T. J., Arbitrator, care of N. Y. C. Car Shops, Pennhurst.
- Orchard, Jno. H., F. C. D., D. & H. Co.
- Osborne, C. H., A. S. C. D., C. & N. W. Ry., Chalfonte.
- Parker, T. E., Continental.
- Peiffer, Charles E., G. C. L., Buff. Roch. & Pitts. Ry., Jackson.
- Pfahler, F. P., M. E., Wheeling & Lake Erie R. R., Isleworth.
- Plank, P. D., M. M., Louisville, Henderson & St. Louis Ry., Windsor.
- Plow, A., Mechl. Inspr., Can. Pac. Ry.
- Prendergast, A. P., S. M. P., B. & O. S. W., Shelburne.
- Prendergast, Jas. L., M. M., Balto. & Ohio R. R., Chalfonte.
- Putnam, C. H., F. C. D., Atlanta, Birmingham & Atlantic Ry., Dunlop.
- Ramage, J. C., Supt. Tests, Southern Ry., Chalfonte.
- Rande, H. C., F. C. R., Newburgh & South Shore Ry.
- Reemney, T., G. M. S., Erie R. R., Holmhurst.
- Richardson, W. P., M. E., P. & L. E. R. R., Windsor.
- Robins, S. P., Chief Draughtsman Car Dept., C. P. Ry., Pennhurst.
- Rockfellow, W. E., Genl. Car Foreman, N. Y. C. & H. R. R., Pennhurst.
- Sasser, E. C., M. M., Southern Ry., Arlington.
- Schrader, J. R., Gen. For. Car Dept., N. Y. C., Young's.
- Selloy, Saml. H., G. F. C. D., B. & A. R. R., Pennhurst.
- Seifert, S. P., Asst. Foreman, Norfolk & Western Ry., Windsor.
- Shackford, J. M., Chief Draftsman, D. L. & W. R. R., Marlborough-Blenheim.
- Shearman, C. S., Chicago Junction Ry.
- Shoemaker, C. A., Gen. Supt., German-American Car Lines, Brighton.
- Sitterly, W. H., Genl. Car Insp., Penna. R. R. Co., Traymore.
- Small, H. J., G. S. M. P., Southern Pacific Co., Chalfonte.
- Smith, A. D., G. S., Cornwall & Lebanon R. R. Co., Brighton.
- Smith, Henry J., Gen. Car Insp., D. L. & W. R. R., Monticello.
- Stark, F. H., Supt., Pittsburgh Coal Co., Chalfonte.
- Sternberg, Adam S., G. I. Car Dept., Wabash R. R., Haddon Hall.
- Stillwagon, Geo. W., M. C. B., P. S. & N. Ry., Lexington.
- Stiffey, S. S., S. M. P., T. & O. C. R. R., Zanesville & Western Ry., Marlborough-Blenheim.
- Stow, Fred T., Delray Connecting R. R., Brighton.
- Sumner, Eliot, M. M., Nor. Central R. R., Chalfonte.
- Sweetmen, E. M., M. M., Southern Ry., Traymore.
- Thiele, Chas. F., Gen. Car Inspector, P. C. C. & St. L. Ry., Haddon Hall.
- Thomas, I. B., M. M., Penna. R. R. Co., Chalfonte.
- Thompson, W. O., M. C. B., N. Y. C. & H. R. R. R., Marlborough-Blenheim.
- Trace, A. A., Chrn. M. C. B. Club, Erie, Melrose.
- Trimyerl, H. L., M. C. B., Seaboard Air Line Ry., Marlborough-Blenheim.
- Tritsch, C. M., S. M. P., Western Maryland R. R., Brighton.
- Vittum, J. E., Chief Joint Inspector, Arlington.
- Waughop, Charles, Cr. Jt. Car Insp., Young's.
- Westervelt, Jos., M. C. B., N. Y. C. & H. R. R. R., Minneapolis.
- Zweibel, C. A., G. F. C. D., Atlantic Coast Line R. R., Elberon.

#### M. M. REGISTRATION.

- Bartlett, Henry, G. S. M. P., Boston & Maine R. R. Co., Brighton.
- Boyd, N. N., M. M., Southern Ry., Pennhurst.
- Cullinan, John, M. M., Central Indiana Ry., Arlington.
- Davis, Joseph, M. M., Pennsylvania R. R., Marlborough-Blenheim.
- Dalton, Wm., Chf. Engr., Amer. Loco. Co., Traymore.
- Hamilton, Taber, M. M., Cumberland Valley R. R., Strand.
- Hammett, Philip M., S. M. P., Maine Central R. R. Co., Brighton.
- Harrigan, John, S. M. P., E. J. & E. R. R. Co., Traymore.
- Henry, J. M., M. M., Penna. R. R., Chalfonte.
- Hildreth, Fred F., M., Vandalia R. R., Dennis.
- Howson, G. N., M. M., Southern Ry., Chalfonte.
- Johnson, Frank, M. M., Southern Ry.
- Marsh, F. E., A. M. M., Penna. R. R. Co., Chalfonte.
- Libby, J. E., Swift Refr. Transit Co., Arlington.
- Mechling, J. E., M. M., Vandalia R. R., Dennis.
- Mercur, R. E., T. M., Westmoreland Coal Co., Traymore.
- Michael, J. B., M. M., Southern Ry. Co.
- Osborne, H., Supt. Loco. Shops, Canadian Pac., Haddon Hall.
- Rhuark, F. W., M. M., Balt. & Ohio R. R., Grand Atlantic.
- Thomas, I. B., M. M., Pennsylvania R. R., Chalfonte.

#### GUESTS.

- Altwater, C. P., Gen. Foreman Car Dept., P. R. R., Amity.
- Amos, J. E., Fman. Passenger Car Ins., Penna. R. R., Elwood.
- Andeucetti, Jos. A., Secy. & Treas. Ry. Elec. Engineers, Arlington.
- Anderson, J. A., Genl. Fman. B. & O., Grand Atlantic.
- Ashley, J. M., Ch. Car Inspector, N. Y. P. & N.
- Ashman, G. H., Asst. M. M., P. R., Craig Hall.
- Backman, J. H., Am. Brake Instruct., P. R. R.
- Baltz, Valentine, Ch. Joint Car Inspector, P. R. R., Norwood.



- Bassett, C. D., Asst. E. M. P., Penna. R. R., Chalfonte.  
 Batchelor, J. M., Clk. M. M., Amboy Div., P. R. R.  
 Bates, K. A., Dftsman M. E. Office, Penna. R. R., Haddon Hall.  
 Bates, S. G., Vice Pres. & G. M., Eastern Kentucky Ry., Marlborough-Blenheim.  
 Bates, W. C., Ch. Clk. Supt., Penna. R. R., Haddon Hall.  
 Barnes, F. McC., For. Car Ins., P. R. R., LaBelle Inn.  
 Barnes, T. W., Gen. Foreman Car Shop, B. & O., Pennhurst.  
 Beaumont, C. A., Clerk, B. & O., Young's.  
 Bennett, A. W., For. Harrisburg, P. R. R.  
 Bennett, G. D., Spec. Guest, C. R. R. of N. J., Edison.  
 Bennett, H. J., Gen. For., Renovo Shops, P. R. R., New England.  
 Bundy, C. L., Genl. Fore., D. L. & W., Haddon Hall.  
 Borell, E. A., Draughtsman, Phila. & P. R. R., Albemarle.  
 Boyer, C. E., Asst. Genl. Car Insp., Penna. R. R., Elwood.  
 Bowen, Arthur P., Div. of Purchases, Pullman Co., Marlborough-Blenheim.  
 Brown, B. S., Draftsman, P. R. R., Dunlop.  
 Brown, W. G., B. & O., Whitta.  
 Brown, Wm., Pa. R. R., 1504 Pacific.  
 Burbage, Isaac J., Ch. Clk. Supt., N. Y. P. & N. R. R.  
 Brubaker, H. H., Motive Power Clerk, P. R. R., Chalfonte.  
 Burch, J. J., Asst. Eng. Tests, Nor. & West., Iroquois.  
 Burgoyne, Chas. J., A. S. Gen. Foreman, P. R. R., Elwood.  
 Burke, C. W., Gen. For., B. & O., Baltimore House.  
 Burns, R. C., Gen. Insp., A. B. & St. L., P. R. R., Elwood.  
 Burton, G. H., Asst. M. M., P. R. R., Chalfonte.  
 Butts, H. M., Mast. Car Painter, N. Y. C., Windsor.  
 Busse, F. W., C. C. to S. M. P., B. & O., Windsor.  
 Calder, W. W., G. F. C., Balt. & Ohio R. R., Baltimore House.  
 Campbell, H. F., M. E., Cinn. N. O. & Tex., Pinehurst.  
 Carter, B. D., Car Foreman, Virginian Ry., Westminster.  
 Case, Truman G., Fman. Car Dept., Pennhurst.  
 Causland, C. J., Ch. Electrician, Penna. R. R., Brighton.  
 Clark, Harold, B. & O., Marlborough-Blenheim.  
 Clark, J. C., For., P. & R.  
 Colgrove, G. B., Ch. Elect., I. C. R. R., Arlington.  
 Connors, J. T., Gen. For., P. R. & Wash. Ter., Schlitz.  
 Copony, A., Chief Draftsman Car Dept., Grand Trunk Ry. System, Windsor.  
 Cox, W. H., Genl. Secty. Y. M. C. A., P. R. R.  
 Cromwell, S. A., G. C. I., B. & O. R. R., Haddon Hall.  
 Crossman, T. E., Official Stenog., M. M. & M. C. B. Convention, Runnymede.  
 Cuill, C. E., Asst. Foreman Eng. House, P. R. R.  
 Davis, Geo. L., C. C. & St., Dunlop.  
 Davis, S. G., Storekeeper, P. B. & W. R. R.  
 Davis, W. H., M. E., N. Y. O. & W., Chalfonte.  
 Dawes, L. M., Elect., P. R. R.  
 Deibel, J. W., Foreman M. P. Dept., B. & O. R. R., St. Regis.  
 Derick, C. T., Rd. For. Eng., Bellwood Div., P. R. R., Iroquois.  
 Dickinson, Frank, Bess. A. C. E., Monticello.  
 Dildine, J. A., Ch. Clk. Motive Power Dept., Penna. Co., S. W. P., Haddon Hall.  
 Dill, H. W., B. & O., Whittle.  
 Disharoon, L. T., For. Blacksmith Shop, N. Y., P. & N., Raymond.  
 Dorwart, J. C., For., P. R. R., Maryland.  
 Donahue, C. M., Motive Power Clerk, Penna. R. R., Buffalo, N. Y., Jackson.  
 Donahue, C. M., M. P. Clerk, Penna. R. R., Chalfonte.  
 Donahoe, D., Genl. Foreman Car Dept., C. N. O. & T. P., also A. & G. N., Raleigh.  
 Donovan, A. G., Armour & Co., Rudolph.  
 Dow, T. W., Gen. Air Brake Co., Erie, Deville.  
 Doud, Willard, Shop Engr., Ill. Cent., Brighton.  
 Drumheller, Dr. T. E., Surgeon, P. R. R., Strand.  
 Dyer, R. H., N. & W. R. R., Haddon Hall.  
 Effinger, Wm. P., Off. Supt. Car Dept., Erie R. R., Melrose.  
 Eliot, H. H., Jr., M. P. Imp., R. R. R.  
 Ellsworth, G. M., Chief Motive Power Clerk, Pennsylvania, Runnymede.  
 Epley, G. A., Chief Clerk, United Rys., Islesworth.  
 Finegan, L. M. M., B. & O. R. R., Brighton.  
 Fisher, E. C., Supt. Rogers' Loco. Wks., Traymore.  
 Flynn, Harry, Gen. A. B. Insp., D. & H., Arlington.  
 Fornwalt, F. E., For. Painter, P. R. R., Ariel.  
 Fosnot, G. N., C. C. to M. M., Cumberland Valley, Strand.  
 Fox, Geo. P., Gen. For., N. Y. Cent., Young's.  
 Franklin, A. G., Asst. Pur. Agt., Armour Car Lines, Marlborough-Blenheim.  
 Frazer, W. H., Pur. Dept., P. R. R.  
 Frost, F. R., Elect. Engr., A. T. & S. Fe, Traymore.  
 Frost, H., A. A. H. For., P. R. R.  
 Fry, B. F., Gen. Car Foreman, D. & R. G., Traymore.  
 Fryer, C. V., Genl. For. Car Dept., N. Y. O. & W., Chalfonte.  
 Gallagher, P. F., Foreman B. M., B. & O., Whittle.  
 Geisking, Charles, Gen. Foreman, P. R. R., Seaside.  
 Gernert, Henry, Fgt. Car Foreman, C. R. R. of N. J., Edison.  
 Gettys, H. L., Rd. Foreman, N. & W., Iroquois.  
 Gilman, J. E., Insp. of Eng., P. R. R.  
 Gilman, C. R., Ch. Elect., C. M. & St. P. R. R., Arlington.  
 Gilmore, W. A., Genl. For., B. & O. R. R., Baltimore House.  
 Gonnerman, Wm. K., Genl. Car Foreman, B. & O., Grand Atlantic.  
 Goodman, W. L., Draftsman M. E. Office, Penna. R. R., Haddon Hall.  
 Goodrich, Gordon, New Holland.  
 Grammar, P. L., Shop C., P. R. R.  
 Grans, S. C., For. M. C. Dept., B. & O.  
 Gray, W. R., C. C. M. M., P. R. R., Dennis.  
 Gunn, F. M., Supt. Pullman Car Wks., Shelburne.  
 Gutteridge, J., Gen. Car Foreman, Kansas City Southern Ry.  
 Hackenburg, J. H., Pur. Agt., Pitts. Al. & McKees., Dunlop.  
 Hanna, D. B., 3d V. P., Canada Northern, Dennis.  
 Hampton, K., Chf. Car Insp., B. & O., Ariel.  
 Hardin, A. T., Asst. Gen. Mgr., N. Y. C., Marlborough-Blenheim.  
 Hart, A. E., Sub. Station Op., West Jersey & Seashore.  
 Hauses, Percy, Draftsman, P. R. R., Dunlop.  
 Haynes, Bradley S., Jackson.  
 Haynes, J. W., Supt. Car Equip., C. & L. R. R., Jackson.  
 Hayward, J. R., N. & W. R. R., Haddon Hall.  
 Heckman, A. V., C. C. to Asst. S. M. P., N. & W., Iroquois.  
 Henderson, P. J., Armour & Co., Rudolf.  
 Hewett, E. F., Gen. For. Meadow Shop., P. R. R., Dennis.  
 Hepburn, M. J., Clerk M. P., Penna. R. R., Chalfonte.  
 Hipple, E. R., Clerk to Acc. Dept., K. & M. Ry. Co., Traymore.  
 Hitch, C. M., Gen. Car Foreman, C. H. & O., Chalfonte.  
 Holmes, Geo., Gen. Storekeeper, Mich. Cent., Marlborough-Blenheim.  
 Hornblower, J. H., C. C. to M. M., Penna. R. R.  
 Hukill, H. O., P. A., Penna. Lines West Pitts., Traymore.  
 Hukill, J. L., Penna. R. R., Brighton.  
 Hukill, W. S., Chf. Draftsman, P., Balto. & Wash.  
 Huntington, C. C., Gen. Storekeeper, L. V. R. R., Brighton.  
 Huntley, W. P., Gen. Foreman, C. & O., Elwood.  
 Ingersoll, G. R., Pur. Agt., L. S. & M. S. Ry., Marlborough-Blenheim.  
 Jansen, E. W., E. E., Ill. Cent., Brighton.  
 Jellison, B. T., Pur. Agt., Ches. & Ohio, Marlborough-Blenheim.  
 Johnson, J. C., For., P. R. R.  
 Justus, I. J., Special Inspector H. S. Dept., N. Y. Central, Pennhurst.  
 Karrigan, W. H., Chief Clerk, P. R. R., Chalfonte.  
 Karrigan, F. J., Chief Clerk, P. R. R., Chalfonte.  
 Kelly O. J., M. M., B. & O., New Berkeley.  
 Kelly, Geo. W., For. Blksmith, C. R. R. of N. J., Chalfonte.  
 Kern, Wm., For., B. & O.  
 Knapp, C. S., M. L., Pullman Co., Shelburne.  
 Lacey, A. B., P. A. Virginian, Dennis.  
 Lamberton, Admiral B., Retired, U. S. Navy, Marlborough-Blenheim.  
 Lane, R. H., Inspector Test Dept., Southern Ry., Chelsea.  
 Langlev, C. E.  
 Lehrsch, G. H., Strkpr., Bellwood Div. P. R. R., Iroquois.  
 Leet, W. B., M. P., Insp., P. R. R.  
 Lewis, A. E., D. & H., Miller House.  
 Lewis, C. E., Gen. For., Jersey City Pa. R. R., Young's.  
 Lillis, De F., Secy., G. S. M. P., R. St. M., N. Y. C. Lines, Marlborough-Blenheim.  
 Lotz, H. B., Genl. Foreman, P. R. R., Elwood.  
 Lucore, F. M., Asst. to Genl. Agt., Amer. Ry. Assn., Dennis.  
 Lukens, H. A., Purch. Dept., Penna. R. R.  
 Lutz, W. W., Supt. Rd., Lexington.  
 Lynch, Geo., Ch. Jr. Insp., All Lines Cleveland, Barton.  
 Lyons, T. F., A. B. Inst., L. S. & M. S.  
 McCormack, Ira A., Asst. Genl. Supt., N. Y. Central, Marlborough-Blenheim.  
 McDevitt, W. H., G. L., P. R. R.  
 McLean, E., Gen. For., South Altoona, P. R. R., Chalfonte.  
 Major, Thos., Motive Power Insp., P. R. R.  
 Marden, Leslie O., Guest, N. Y. C., Haddon Hall.  
 Marklev, C. C., Pur. Dept., N. Y. P. & N. R. R.  
 Marshall, Geo., For. Jersey City, Pa. R. R., Young's.  
 Martin, M. J. W., Traymore.  
 Mayo, Frank, Foreman Sunnyside, P. R. R.  
 Mason, E. F., Asst. Eng., P. R. R., Chalfonte.  
 Mendenhall, D. H., Genl. Fman, P. R. R., Norwood.

Meriman, M., C. Clerk Motive Power, West. Md., Brighton.  
 Mervine, I. B., M. P. Clerk, W. J. & S. R. R., Traymore.  
 Mahar, F., M. M., N. Y. Central & H. R. R., Abbott.  
 Mahar, Wm., Asst. M. M., N. Y. C. & H. R. R., Abbott.  
 Minor, H. C., Inspector, Penn. R. R., Shelburne.  
 Montague, W. T., Office G. S. M. P., P. R. R.  
 Moore, Edw., C. M., Genl. For. Off., W. J. & S.  
 Morris, W. W., Pur. Dept., P. R. R.  
 Morrison, C. A., Stm. Convention, Runnymede.  
 Mosley, W. S., Jr., Mech. Dftsman, C. C. & O. R., Traymore.  
 Mudd, Frank X., Gen. Mgr. Live Poultry Trans. Co., Marlborough-Blenheim.  
 Murhelsen, J. A.  
 McMullern, John, Gen. For. Car., Erie, Chester Inn.  
 Mulholland, W. J., Pur. Agt., American Rwy. Co., Brighton.  
 Murray, J. S., President's Office, B. & O. R. R., Chalfonte.  
 Myers, J. H., Fman Car Shop, Penna. R. R., Elwood.  
 Nation, J. D., Trav. Eng., P. R. R.  
 Nelson, Wm J., Jr., Clerk Pur. Dept., Penn. R. R.  
 Nicholas, R. D., Gen. For., Cent. of N. J.  
 Norris, J. C., For. Con. Shop, Cumb. Valley, Strand.  
 Oakley, R. H., Gen. Car. Insp., Erie, De Villa.  
 O'Brien, E., Eng. For., Penn. R. R.  
 O'Dea, P. J., Asst. Supt. Car Dept., Erie R. R., Chester Inn.  
 Oren, J. W., Eng. House Foreman, N. Y. P. & N., Raymond.  
 Parker, Fred, N. Y. Central, Marlborough-Blenheim.  
 Parks, Geo. E., C. D., N. Y. Central Lines, New England.  
 Patterson, Geo. W., Ch. Clk. to Gen. Supt., Penna. Lines S. W., Sewickley.  
 Patterson, P. F., P. R. R., Columbia.  
 Pearsall, R. H., Mechanical Engineer, England, States Villa.  
 Peddle, C. R., P. A., Vandalia R. R., Young's.  
 Pierce, Harry, Sec., P. R. R., Maryland.  
 Price, Jas. H., M. P. Clerk, P. B. & W. R. R., Morton.  
 Pierce, Robt., For., P. R. R., Maryland.  
 Pletscher, H. B., Accountant, P. R. R.  
 Porter, W. M., Gen. For. Trenton, P. R. R., Young's.  
 Portner, W. H., Genl. Car Inspector, Alabama Great So., Clifton.  
 Powell, N. C., Yardmaster, Penna. R. R., Westminster.  
 Rafter, E. L., Special Apprentice M. P. Dept., P. R. R., Chalfonte.  
 Reilly, Thos. E., Spc. Agt. Supt. Ft. Trans., P. R. R., Chelsea.  
 Renner, C. W., Asst. G. F., P. R. R., Chalfonte.  
 Reyno, Elmer, Stkpr., P. R. R.  
 Rhodes, R. S., Elec. Dept., N. Y. Central, Iroquois.  
 Robbins, F. S., Asst. R. F. E., P. R. R., Haddon Hall.  
 Robertson, A. W., Pass. Dept., D. L. & W. Edison.  
 Robins, J. B., For. Pattern Makers, C. R. R. of N. J., Edison.  
 Roem, Otto, Ch. Clk., M. C. B., Mott Haven Shops, N. Y. C., Camblos.  
 Rourke, B., Engineer, Penna. R. R., Maryland.  
 Runk, W. H., Pipe Fitter, P. R. R.  
 Rupert, J. W., M. P. Insp., B. & O., Penhurst.  
 Russell, G. W., Genl. Equip. Inspector, N. Y., P. & N.  
 Russell, T. N., Genl. Insp. Car Dept., C. H. & D., Haddon Hall.  
 Rusling, W. J., Genl. Foreman, P. R. R., Chalfonte.  
 Salisbury, R. W., Insp., B. & O., Kenderton.  
 Schenck, E., Jr., Asst. M. M., Penna. R. R., Young's.  
 Schley, Winfield Scott, Admiral Retired, U. S. N., Runnymede.  
 Schuyler, A. J., Mech. Inspector, Virginia River.  
 Shapley, R. R., P. R. R.  
 Singleton, C. W., Shop For., P. R. R., Radnor.  
 Skelly, John J., P. R. R., Chelsea.  
 Sloan, J. R., E. E. C. L., M. P. Dept., Penna. R. R.  
 Small, Alfred, Chalfonte.  
 Small, Chas, Chalfonte.  
 Smith, E. J., Storekeeper, Harrisburg, P. R. R.  
 Spoor, Miss Lillian M., Haddon Hall.  
 Stanton, E., C. J. Car Insp., West Jersey & S. R. R., Westminster.  
 Starritt, W. A., Pur. Agt., C. C. & O., Strand.  
 Stewart, G. M., Master Blacksmith, P. R. R., Westminster.  
 Stewart, W. B., Clerk to S. M. P., B. & O., Colwyn.  
 Stoll, W. J., Chief Int. Insp., Dunlop.  
 Stone, H. H., Retired For., P. R. R., Chalfonte.  
 Sweetman, Edwd., South Ry., Traymore.  
 Streib, J. F., Mech. Eng., Pitts. Al. & McKees, Marlborough-Blenheim.  
 Taylor, F. C., M. P. Inspector, P. R. R., Elmont.  
 Taylor, J. C., For. Boiler Shop, N. Y. P. & N., Raymond.  
 Taylor, F. C., Inspector, Chalfonte.  
 Tebley, Rev. R. B., Penna. Y. M. C. A.  
 Thompson, W. T., Supt. Car Dept., Windsor.  
 Thompson, W. S., Div. Eng., Penn. R. R.  
 Tonge, J. H., Supt., Cumb. Valley R. R., Strand.  
 Torback, F. S., Shop Foreman, B. & O. R. R., Wittle.  
 Tozzer, Geo., Pur. Agt., C. C. C. & St. L., Marlborough-Blenheim.

Tracy, Thos., Asst. Supt. Car Dept., Erie R. R., Chester Inn.  
 Trego, J. G., Asst. R. F. E., West Jersey.  
 Turner, J. A., Ch. Clk. Pur. Dept., Southern Ry., Dennis.  
 Utley, E. H., V. P. & G. M., Bess. & L. E., Chelsea.  
 Vanderloo, Theo., Mch., P. R. R.  
 Wyne, A. G., Asst. Eng. House Foreman, P. R. R., Islesworth.  
 Waitt, G. L., Inspector of Materials, N. Y. Cent. & H. R. R., Stanton.  
 Watson, D. H., Genl. Foreman, B. & O., Strand.  
 Wayward, J. R., Div. Car Insp., N. & W., Haddon Hall.  
 Weaver, C. N., Supr. A. B., L. S. & M. S.  
 Weightman, Jos. J., Clerk, P. & R., Monticello.  
 Weigle, John, Gen. For. Car Inspectors, P. R. R., Edward.  
 Wenzel, C. F., Fman. Frt. Car Inspectors, Penna. R. R., Elwood.  
 Westcott, E. A., Supt. Car Dept., Erie, Denny.  
 Wilson, F. G., For., P. & R., Monticello.  
 Wilson, W. H., For. Car Dept., N. & West., Strand.  
 Wilson, O., Mech., Penna. R. R., Flender.  
 Wilkins, O. R., Foreman Painter, N. & W., Windsor.  
 Witherspoon, W. H., Foreman, C. R. R. of N. J., Dennis.  
 Wray, R. W., Motive Power Insp., P. R. R.  
 Young, W. D., Asst. Comm. Insp., Balt. Div., P. R. R., Iroquois.

#### SOME ANTIQUE RAILWAY RULES AND REGULATIONS.

Walter B. Wood has been showing to his railway friends at the conventions an interesting antiquity. It is a copy of the Rules and Regulations of the Pittsburgh, Fort Wayne & Chicago Railway for 1858 and 1859. George W. Cass was then president of the road and J. Edgar Thomson, subsequently president of the Pennsylvania Railroad, was its chief engineer.

Some of the rules seem curious to railway men now.

One provides that "the maximum speed for passenger trains will be a mile in a minute and a half (and in 4 minutes over large bridges) and for freight trains a mile in 4 minutes." Passenger trains are required to "wait at stations where meeting is designated twenty-five minutes for each other, when, if either is delayed beyond that time, the other will wait five minutes more, making thirty minutes in all, then proceed, keeping precisely thirty minutes behind its own time card, until it has met and passed the delayed train. The five minutes are allowable for any possible difference in watches, and must not be used by the delayed train approaching the meeting point or any station where it expects to meet the opposing train. Should any trains be delayed at the same time, and fail to reach the meeting point within the twenty-five minutes, they will each at station where the other is due according to the foregoing rule, twenty minutes, making in all fifty minutes, behind the time card of the expected train, then proceed with the greatest caution, where curves occur, each sending forward a man with proper signals, so as to see at least a half mile ahead; and the engineer keeping his train fully within control until the expected train is passed. Take no risk—always, in case of doubt or uncertainty, adopt the safe rule." No wonder transportation in those days was slow and tedious!

Another rule provides that the "whistle must always be sounded twice before any engine or train is started (except in Allegheny City, east of the outer depot, where it must not be sounded except to prevent accidents." The indications are that there already were some active regulating authorities in Allegheny City, as this also was the only point on the line where trains were specifically prohibited to be run over eight miles an hour. Its people objected to either speed or noise.

It was further provided that "a signal swung across the track will stop the engine; raised and lowered perpendicularly, the engine will move back slowly; and swung broad off to the right or left the engine will move forward." "Passenger trains having the right to pass any station on the line without stopping, must be seasonably checked so



as not to pass the station faster than fifteen miles the hour."

Another rule which was evidently not calculated to increase speed, and which would hardly do today for the Pennsylvania Special, provided that "every engine with or without a train must be brought to a dead standstill at each of the several railway crossings on the line; and the conductor of the train or the fireman employed on the engine, must pass on to the crossing and give a signal that the way is clear, before the train or engine is allowed to pass over it."

It would seem that the trainmen in those days were suspected of "soldiering" or going fishing at stations, for rule 15 said that "trains, passenger or freight, must not be run between stations so as to gain time to be wasted at the stations. Ordinarily one-half minute for a passenger train at any station where wood and water is not taken is ample time for the conductor to discharge and take up his passengers."

A very decent regard was shown for the rights of live stock. Rule 27 required that "When live stock is seen ahead on the track, the engine must be stopped, if possible, and the live stock driven off to prevent accident to the engine and injury to the stock. Delays caused by a careful observance of this rule will be a good excuse for being behind time and losing connections with trains on other roads. The conductor will, without fail, report the number of times in each trip the engine was checked to avoid such stock."

The developments that have taken place in car heating since those primitive days are indicated by a requirement that "wood shall not be piled up about the stove and elsewhere in the cars to the annoyance and inconvenience of passengers."

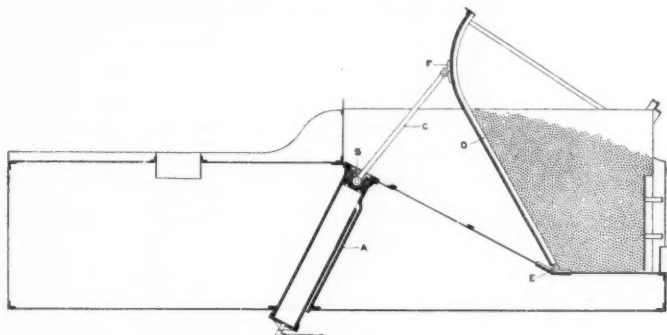
The modern passenger brakeman will feel that his job is a snap when he reads the following: "Passenger train brakeman will generally ride upon the platforms of the cars while the train is in motion, but during inclement weather they may stand at the door inside of the cars ready to apply the brakes in case of alarm, and to stop the train at the stations; they will supply the cars with fuel for the stops in winter, from the wood boxes on the line; and keep the cars comfortably warm and clean at all times while the cars are upon the road, and the lamps burning during the night." The passenger brakemen of those days would have thought that the passenger brakeman of to-day, heated as he is by the numerous appliances now used on passenger trains, has very little to do but flick the dust from his uniform and look pleasant.

The conductors probably thought that the rule saying that

"conductors have no discretion to allow passengers to pass free" was very arbitrary. However, they probably did not pay much attention to it.

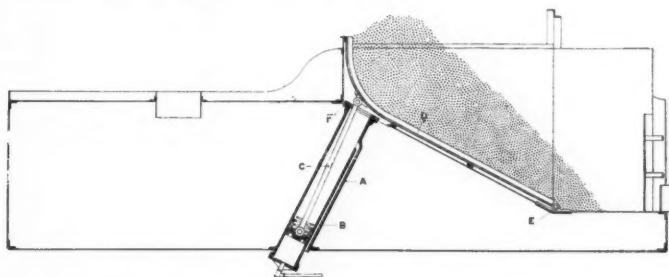
### COAL PASSERS ON LOCOMOTIVE TENDERS.

The new Mikado locomotives built for the Burlington by the Baldwin Locomotive Works, Philadelphia, have their tenders fitted with a device which is intended to deliver the coal from the back part of the tender to the front space so



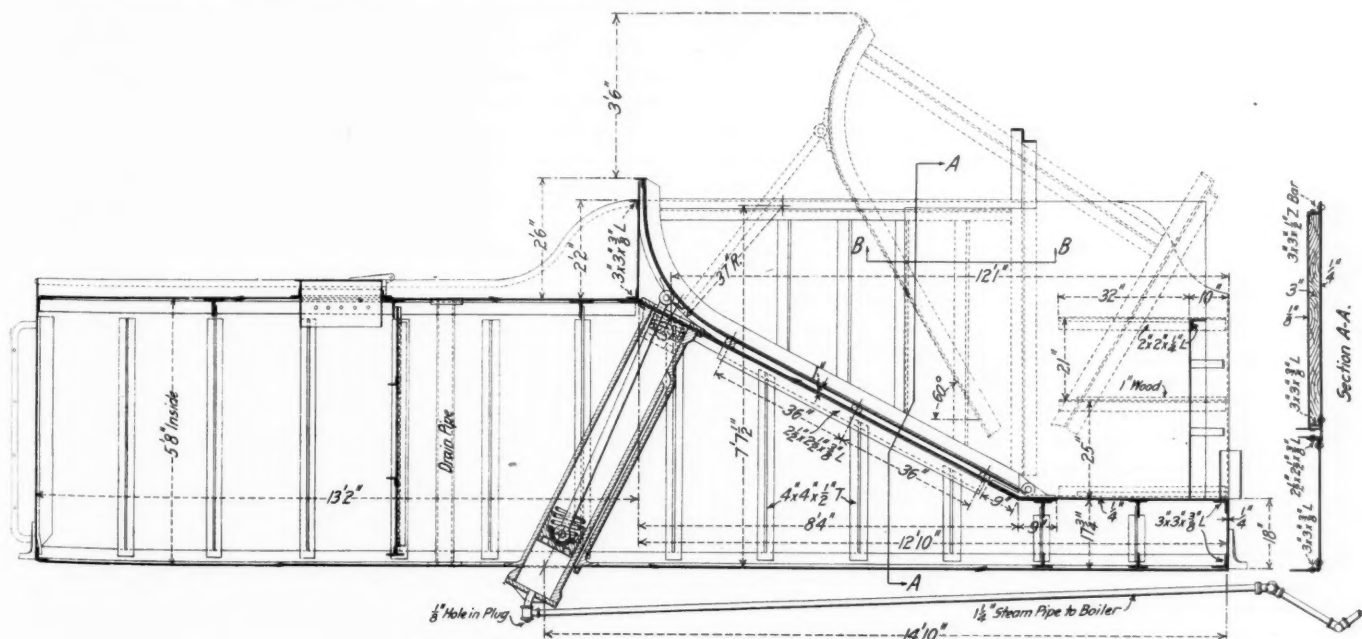
### Ryan-Johnson Coal Passer Lifted.

the fireman may handle it more conveniently. It is the invention of Ryan & Johnson, Clinton, Iowa, and is illustrated herewith. The inclined floor of the coal space is covered with an extra sheet bottom which is stiffened by three



### Ryan-Johnson Coal Passer Ready for Lifting.

longitudinal angles 4 in. by 4 in. by  $\frac{1}{2}$  in. This plate is hinged at the bottom and the top is pin-connected to a rod working in a vertical trunk steam cylinder. When the coal



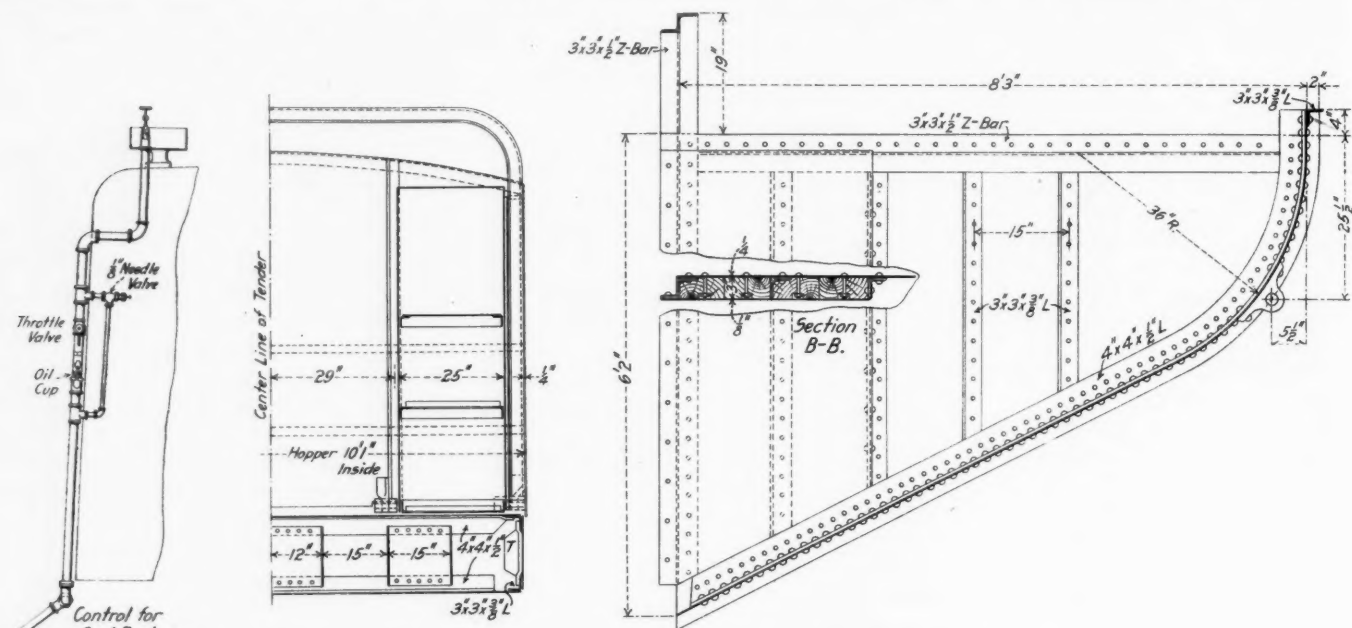
**Ryan-Johnson Coal Passer for Locomotive Tenders.**

in the front of coal space has been used, steam is admitted to the cylinder and the false bottom is raised to a steep incline so that the coal flows forward. The maximum travel of the piston is regulated by a vent opening in the cylinder wall and when the piston passes this opening steam escapes through the vent and the movement is automatically stopped. The steam pipe is  $1\frac{1}{4}$  in. in diameter and is covered with magnesia lagging. Admission of steam to the cylinder is controlled by a three-way cock placed in the cab. It is thus possible to raise the pusher to any desired height and lower

Billy Rosser was a kid when Cap. Anson was raising colts in Chicago. Bill had a private knothole in left field fence, and between innings, when the hole was out of commission, he would blow through it and found he could make funny noises. Here at this knot hole was Bill's beginning as a bass horn player.

Charlie Bird and Joe Violand, the drummers, will probably accept positions with Pryor's band before the season is over, providing Jaybill Johnson will accept waiver.

Joe Taylor was a boy in knickerbockers around his father's



Steam Operating Connections and Details; Ryan-Johnson Coal Passer.

it after the coal has rolled forward by allowing steam to escape through the three-way cock to the atmosphere. A flexible pipe with ball and slip joints conveys steam from the boiler to the vertical cylinder.

#### THE BAND MYSTERIOUS; HOW IT WAS DONE.

Our special correspondent detailed to delve out the past performances of the members of the "Band Mysterious," now officially adopted as the convention band, has discovered some valuable information which we now make public for the first time.

Leader J. Will Johnson was a born musical prodigy. His nurse first saw his talent when she, one day, found him blowing into his baby milk bottle, making funny noises and faintly and indistinctly murmuring, "Do, Re, Me, etc." As an engineer Will carried a cornet in his seat-box, and while lying on sidetracks he tooted from the top of a box car to the sage brush scenery of the wild and wooly West. Jaybill was the instigator and drill master of the convention band.

Mark Ross' first play-toy was a tin whistle. At the age of four he learned to play "Old Grimes is Dead," and at ten he could knock the stuffin' out of a concertina. It was a simple and quick route for one of Mark's ability to develop into a cornetist without a peer in the convention band, except Johnson.

Charlie Pilliod was an apprentice in his father's clock shop in Switzerland many years ago when he began to develop his musical talent and prepare for the convention band. After stopping the clocks, so as to lose no time, he would hie himself to an adjacent mountain nook, and there, with his clarinet, would melt the glaciers to tears.

plumbing shop in Kankakee when he discovered he could make sounds by blowing into a piece of pipe. So pleasing was this to Joe and so annoying to others that Joe's father was obliged to double-lock the shop doors and neighbors took in their tubes at night to prevent Joe from continually hitting the pipe. By easy stages Joe developed into the solo baritone player of the convention band.

Fred Nellis learned to play the slide trombone while a conscript in the German Army. He afterwards saw considerable service in the Salvation Army band at Alliance, Ohio.

Len Wilson says he can't remember when he learned to play the trombone, and Jaybill Johnson says he doesn't care so long as Len can toot so well.

Will Sharp, one night, had a dream that he could play an alto horn, so he bought one and set to practicing. After starring a brief season with a moving picture show he convinced Jaybill Johnson that he was the right man in the right place in the convention band.

Frank Gault always was a star trombone player. Arthur Pryor has nothing on him.

Back on the old home farm in Vermont, George Bryant often left the churn to the difficult task of making its own butter, and hid himself in the hay mow to tickle the Jew's harp between his lips. With such genius and opportunity is it any wonder that George developed into the brilliant alto player of the convention band?

Twenty years ago Phil Sreda tickled the reed of a clarinet while herding sheep on the sunny slope of a mountain in Italy. One day he took a notion that he would like to learn to wear shoes, so he came to America. The shoes hurt Phil's classic feet like fury for a while, but finally persistence conquered, and he now wears shoes every day. Did you notice those natty white canvas shoes in Saturday's parade?



## The Exhibit.

To take care of its business with Canadian railways, the Buffalo Brake Beam Company, New York, is now operating a new factory at Brantford, Ont.

The Kennicott Company, Chicago, is represented at the convention by Chauncey Blair, son of the president, Cass L. Kennicott, George E. Pratt and T. G. Windes.

The Buffalo Brake Beam Company, New York, has recently installed at its Buffalo factory a complete and up-to-date testing laboratory, equipped with special apparatus for testing brake beams.

M. L. Evans, who possesses a height of six feet four, has no trouble at all in reaching to the top of his car door (the Williams) or even to the car roof, and pointing out the merits claimed for the device.

The Standard Coupler Company, New York, has on exhibition this year types A, D and F of its standard steel platforms and buffing mechanisms, and types C and K of the Sessions standard friction draft gear.

The T. H. Symington Company, Baltimore, Md., is exhibiting a full size draft gear model with malleable iron draft sills attached to wood center sills, the sills being of a special design controlled and made by the Haskell & Barker Car Company.

The United States Metal & Manufacturing Company, New York, reports that some of the cars furnished with the Dunham hopper door device have been running since 1903, and that this mechanism is still giving satisfaction on the other cars equipped with it.

Greene, Tweed & Company, New York, have installed in space 606 a large pyramid of Palmetto and Manhattan packings and other specialties made by the company. They are also distributing for the first time at any convention a complete catalogue of their products, containing also a telegraph code and other necessary data.

The Bartley self locking nut and bolt fastener and a joint fitted up with the Bartley combined nut bolt and bond wire fastener, made by the American Nut & Bolt Fastener Company, Pittsburgh, Pa., are on exhibition at booth 320. The self locking fastener was patented January 17, 1911, and the combined nut bolt and bond wire fastener, on April 18, 1911.

The General Electric Company, Schenectady, N. Y., is distributing a pamphlet dealing with the use of electricity by steam railways. It is profusely illustrated with interior and exterior views of some of the most notable power houses in this country; views of electric locomotives and motor cars; and the application of electricity to signal service and train and building lighting.

The United States Radiator Corporation, Detroit, Mich., is exhibiting at the convention for the first time this year. The following representatives are here: Frederick W. Herendeen, general manager sales; George W. Barr, manager of the Philadelphia branch; G. C. Blackmore manufacturer and member of the executive board; and Joshua Naylor, manager of the Baltimore, Md., branch.

H. S. Waterman, formerly chief engineer of the Detroit & MacKinac, is attending his first convention as sales manager for the Hutchins Car Roofing Company, Detroit, Mich. D. W. Hawksworth, who attended last year's convention as mechanical engineer of the Hutchins Car Roofing Company, is here as vice-president. Both Mr. Waterman and Mr. Hawksworth make their headquarters at Detroit.

The Gold Car Heating & Lighting Company, New York, exhibits its No. 800 steam hose coupler, which possesses the essen-

tial quality that it will not leak. When coupled in the ordinary way it is partially locked, and by a simple device, embodied in the coupler, this lock is made positive. The other good features are that it will couple with all makes of medium size and small couplers as well as lock them, making an interchangeable coupling.

All who are interested in car seats and seat coverings are invited to visit space 20 in the Main Building. The Massachusetts Mohair Plush Company has there a number of seats from well-known makers covered with Bay State brand plushes and freizettes. Go in and sit on the freizette seats and see how cool they are in this hot weather. This is one of the booths on the pier in which you can sit on the exhibit all you wish; and the harder you sit the more the exhibitor will be pleased.

S. F. Bowser & Company, Fort Wayne, Ind., are showing a line of storage system in their pumping and registering apparatus for handling lubricating and paint oils, varnish and similar fluids. There was considerable delay in the arrival of the apparatus, and one of their newest features, a filtering and oiling system, was lost. The non-arrival of this device is a considerable disappointment, as the makers believe it would have aroused much interest, particularly among railway men who want economy-promoting installations.

The Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., is a large maker of miscellaneous steel castings for railway and industrial purposes. The basic open hearth process is used, and the steel produced has been proved to be adapted to the requirements of railway service, meeting stringent specifications, both chemically and physically. Its miscellaneous plant contains three 20-ton furnaces, with improved appliances to produce castings of a superior quality; and a new feature is the large pattern shop, recently finished, which enables the company promptly to make any necessary repairs to customers' patterns, or, when desired, furnish new patterns.

The Commercial Acetylene Company, New York, has a more than usually attractive space, in which are shown various types of headlights, including a complete set with which 1,000 engines on the Boston & Maine were equipped during the past year. The collection contains other engine lamps, such as classification, steam gage and water glass lamps, all connected with their standard asbestos-packed acetylene cylinders by drawn steel tubing. Center lamps and side brackets of attractive design for car lighting are also shown. The booth is fitted up with a complete installation for lighting a signal lamp. New compression fittings and a new form of wire-bound asbestos-covered flexible tubing are to be found there. Another unusual feature of the exhibit is a marine flashlight with the cylinder cut open to show the interior and cylinders for storing acetylene for oxy-acetylene welding.

Heretofore the name of the McConway & Torley Company, Pittsburgh, Pa., has been usually associated with the production of the Janney and other M. C. B. couplers. This year the company is showing, in spaces 617, 619, 621, the following new departures in other lines of manufacture: The McConway wheel; a built up wheel with a cast steel center and rolled steel tire without bolts or rivets. The Buhoup flexible truck; a cast steel truck having vertical flexibility to prevent derailment on rough or uneven track, a large area for distribution of load, and large spring capacity. The Penn freight coupler; a late development of the Janney type of coupler similar to the Pitt and Janney X couplers so far as mechanical operation of parts is concerned, but with a largely increased bearing surface between the knuckle and the locking pin this contact being 5 sq. in. Steel Castings for railway work. In addition it is showing full size samples of the Buhoup 3-Stem and Pitt couplers for passenger equipment and of the Janney X freight coupler.

The United States Light & Heating Company, New York, is exhibiting at Spaces 374-7 a real live axle light equipment. A full-sized model of a standard truck is shown, on which is mounted a full-size generator and suspension. The axle is driven by a variable speed motor, taking power from the electric supply wires on the pier. This driving motor is controlled by an automatic controller, which causes the motor and the axle light generator to go through a speed cycle which accurately represents the speed conditions on a local train running from station to station. The apparatus starts from rest, comes gradually to a speed of 80 m. p. h., runs at this speed a little while, then drops off to 40 miles, again goes up to 80, and finally gradually comes to rest, making a stop of about a minute. The entire cycle occupies about 10 minutes, and is continued all day long. The car lamps are also automatically turned off and on in various combinations by means of a little sign flasher. There is no connection whatever between the operation of the speed controller and the sign flasher; and thus a hit and miss condition is secured which faithfully represents what goes on in an axle-light system. There is no throwing on of lamps at the "psychological moment" to favor some peculiar condition. This is the first time such an automatic arrangement has ever been exhibited.

#### LIST OF EXHIBITS.

The following include the names of those exhibitors whose exhibits were not included in the list printed in *The Daily of June 14*, together with some few corrections to that list:

- American Locomotive Company, New York, N. Y.—Reception booth with photographs of locomotives. Represented by James McNaughton, H. F. Ball, G. M. Basford, J. D. Sawyer, J. E. Dixon, W. P. Steele, H. B. Hunt, C. J. Donahue and Wm. Dalton. Spaces 422, 424.
- American Rolled Gold Leaf Company, Providence, R. I.—Gold leaf for car striping. Represented by E. A. Smith, T. J. Lawler and Chas. H. Bower. Space 23.
- Atlas Car & Manufacturing Company, Cleveland, Ohio.—Two cars. Represented by L. W. Harston. Space, on track.
- Boss Nut Company, Chicago, Ill.—Demonstration of the application and service of the Boss nut; literature, etc. Represented by B. M. Osburn and John A. MacLean. This company is exhibiting in space 330.
- Blackall, R. H., Pittsburgh, Pa.—Ratchet brake levers. Hose protector ferule. Represented by R. H. Blackall. Space 652.
- Chicago Pneumatic Tool Company, Chicago, Ill.—Pneumatic tools, hammers and appliances, compressors and electric drills. Represented by Thomas Aldcorn, W. P. Pressinger, J. T. Duntley, C. E. Walker, James McCabe, G. A. Barden, Geo. A. Rees, L. Summers and H. Kinman. Space 648.
- Coale Muffler & Safety Valve Company, Baltimore, Md.—Safety valves for locomotives. Represented by H. C. McCarty. Space 589-590.
- Eagle Glass & Manufacturing Company, Wellsburg, W. Va.—Welded steel and one-piece oil cans, torches, buckets and supply cans. Represented by J. L. Fusner. Space 656.
- Fort Pitt Malleable Iron Company, Pittsburgh, Pa.—Brown journal boxes. Represented by F. J. Lanahan, P. Brown and A. M. Fulton. Space 650.
- Gold Car Heating & Lighting Company, New York, N. Y.—Heating, lighting and ventilating apparatus for passenger and refrigerator cars. Represented by E. E. Gold, E. B. Wilson, A. B. Strange, W. E. Banks, W. H. Stocks, J. M. Stayman, G. F. Ivers, F. H. Smith, E. J. Ronan, J. O. Brumbaugh, F. O. Bailey, A. D. Stuver and F. A. Purdy. Spaces 301 to 311, inclusive.
- Jessop & Sons, Inc., New York, N. Y.—Tool steel, sheet steel and steel for circular saws. Represented by John E. Sandmeyer, O. H. Reynolds and W. F. Wagner. Space 416.
- Johnson Manufacturing Company, The, Urbana, Ohio.—Railway standard galvanized iron and tinware. Represented by Isaac T. Johnson and Joseph M. Brown. Space 330.
- Kennicott Company, The, Chicago, Ill.—Photographs of all Kennicott products to date. Represented by Chauncey B. Blair, Cass L. Kennicott, Thos. G. Windes, Jr., and G. E. Pratt. Space 650.
- King Fifth Wheel Company, Philadelphia, Pa.—Roller-bearing pivot plate. Represented by A. O. Chase. Space 622.
- Remy Electric Company, Anderson, Ind.—American electric headlight. Represented by T. B. Arnold.
- Rockwell Furnace Company, New York, N. Y.—Furnaces

for railway shops. Represented by W. S. Quigley, S. L. Barnes and F. S. Garrett. Space 2.

Scullin-Gallagher Iron & Steel Company, St. Louis, Mo.—Steel castings. Represented by F. L. Norton, Geo. L. L. Davis, S. R. Fuller, Jr., and H. H. Waldron. Space 25.

Sipe & Company, James B., Pittsburgh, Pa.—Drying oils. Represented by R. E. Rogers and W. F. Robinson. Space 636.

#### STANDARD STEEL WORKS' EXHIBIT.

Among the interesting exhibits at this convention is that of the Standard Steel Works Company, Philadelphia, Pa. Among other things, it is showing a ring 120 in. in diam., 9 in. face and 4 in. thick, and weighing 3850 lbs. While the ring is not applicable to railway service as a driving tire, it affords an opportunity to see the possibilities of such rings being rolled, instead of cast. The ring was made in identically the same manner as in the manufacture of driving tires. Considerable difficulty is experienced in securing solid steel castings, and it has proven very expensive to discover defects after they have been partially machined. With a solid ring, there cannot be any such defects.

A steel-tired wheel, called the Standard No. 3 wheel, also is exhibited. It is fitted with a rolled steel center, which provides a wheel that can be used indefinitely. The center never wears out; and it is only necessary to apply a new tire when required. It is the best type of wheel that has ever been evolved. The tire is shrunk on the center, and is held securely in place by bolts, which pass through the tire, as well as the wheel center. With this method there is never any danger of loose tires, regardless of how thin they may be worn. The wheel can be re-tired at any railway shop without the use of skilled labor or special machinery. The price received from the sale of the worn-out tires as scrap is very much in excess of the shop cost of the re-tiring.

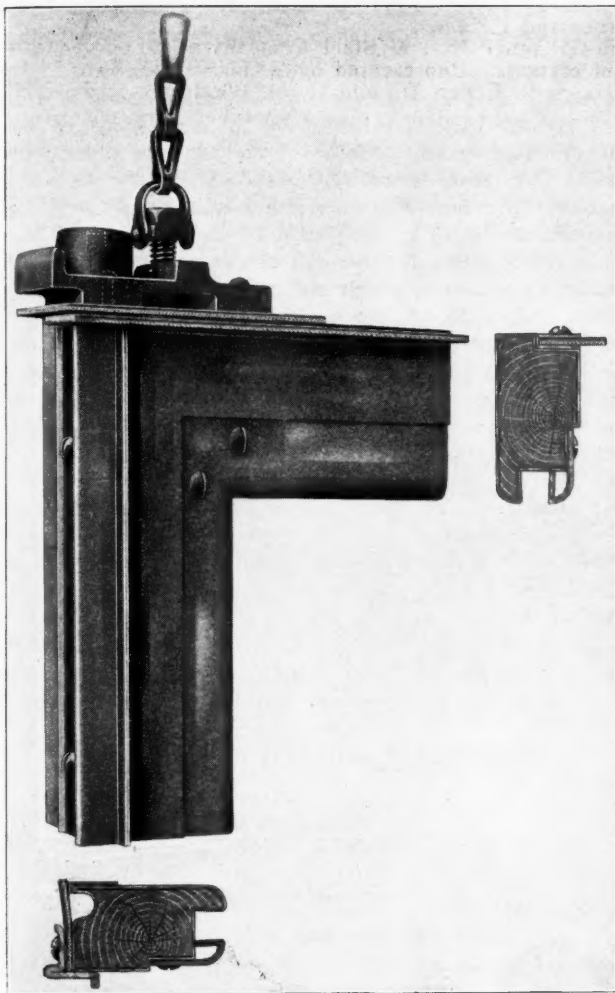
A solid rolled steel wheel, from which a section had been cut so that the quality of the steel might be seen, is shown. These wheels are manufactured by a method whereby the center of the ingot blank is punched therefrom for the bore of the wheel, and the outside of the ingot becomes the periphery of the wheel. This leaves for the wearing surface the best part of the steel as it is a demonstrated fact that the outside of the ingot is such.

The company also displays castings, forgings and springs of the usual Standard quality, together with a heat-treated driving axle. At the present time the matter of axle failures is a very live subject to those who are welcoming any improved method of manufacture which will assist in eliminating this very serious trouble. It is believed that heat-treating the axle improves it so that failures are eliminated. The Standard Company is expert in heat-treating, having given it most careful thought and conducted many experiments.

#### UNIVERSAL INSULATED ADJUSTABLE COPPER CAR WINDOW SASH.

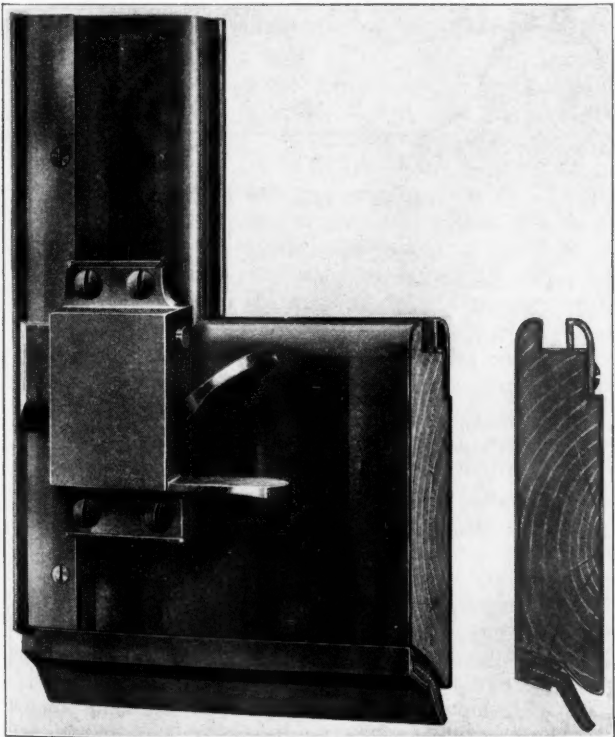
Universal insulated adjustable copper sash, made by the McCord Manufacturing Company, Chicago, is being applied to a great many metal cars. This sash is claimed to be proof against rust and corrosion of all kinds and is therefore practically indestructible, and as the surface of the sash does not come in contact with the window frame and is constructed so it has no bearing or wearing surface it cannot wear out from friction. The Universal sash construction forms an insulation which prevents all radiation of cold and heat through the structure. It is adjustable and provides for the usual inaccuracies of construction of metal car window openings. It is necessary to have means of adjustment to take care of the necessary loose joints around the sash. These are provided for by Universal weather stripping, and the adjustable chain connections attaching the sash balance. The means for adjusting Universal metal sash provides for the inaccuracies of





Universal Copper Insulated Sash and Balance Chain.

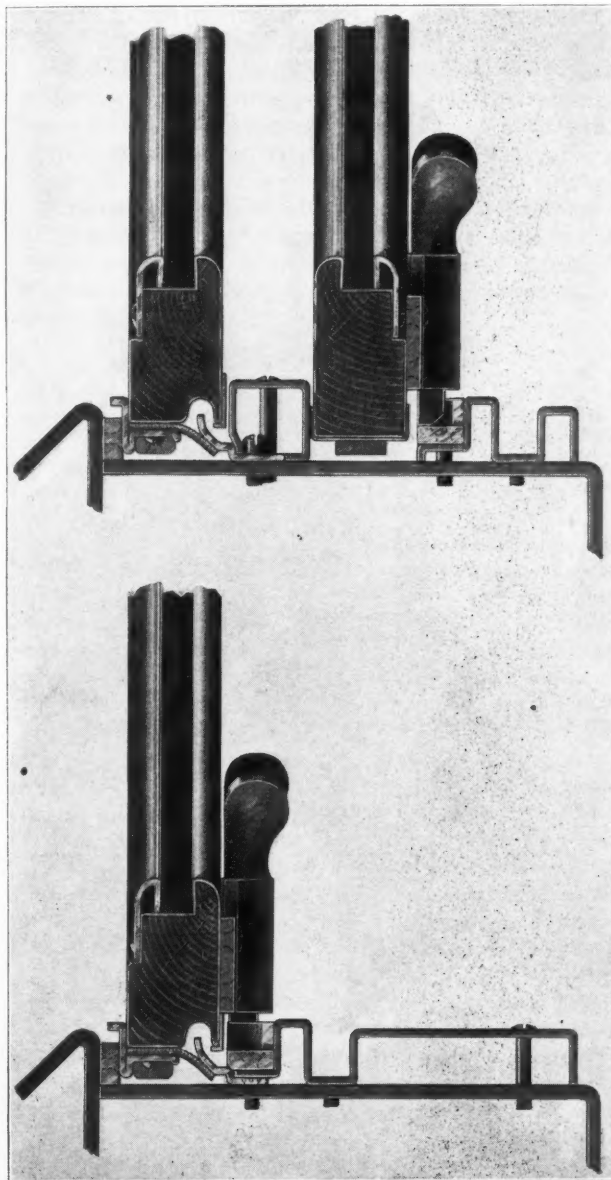
windows as much as  $\frac{1}{4}$  in. out of square, at the same time sealing the openings around the sash, thus providing a wind and weather proof window, the sash of which will raise easily



Universal Copper Insulated Sash, Lock and Weather Strip

at all times, regardless of weather conditions, and are rendered noiseless. By the use of Universal weather stripping, double sash is not a necessity.

Universal sash is made of copper, on which it is not necessary to maintain paint. The simple method of attaching the sash bead with wood screws provides a superior holding and is claimed to eliminate from 15 to 20 per cent. breakage of glass. It does away with all machine screws used in the ordinary metal sash construction, which are very often driven in by the workmen with a hammer instead of with a screw-driver. The natural tendency of machine screws in such light construction is to become loose and work out.



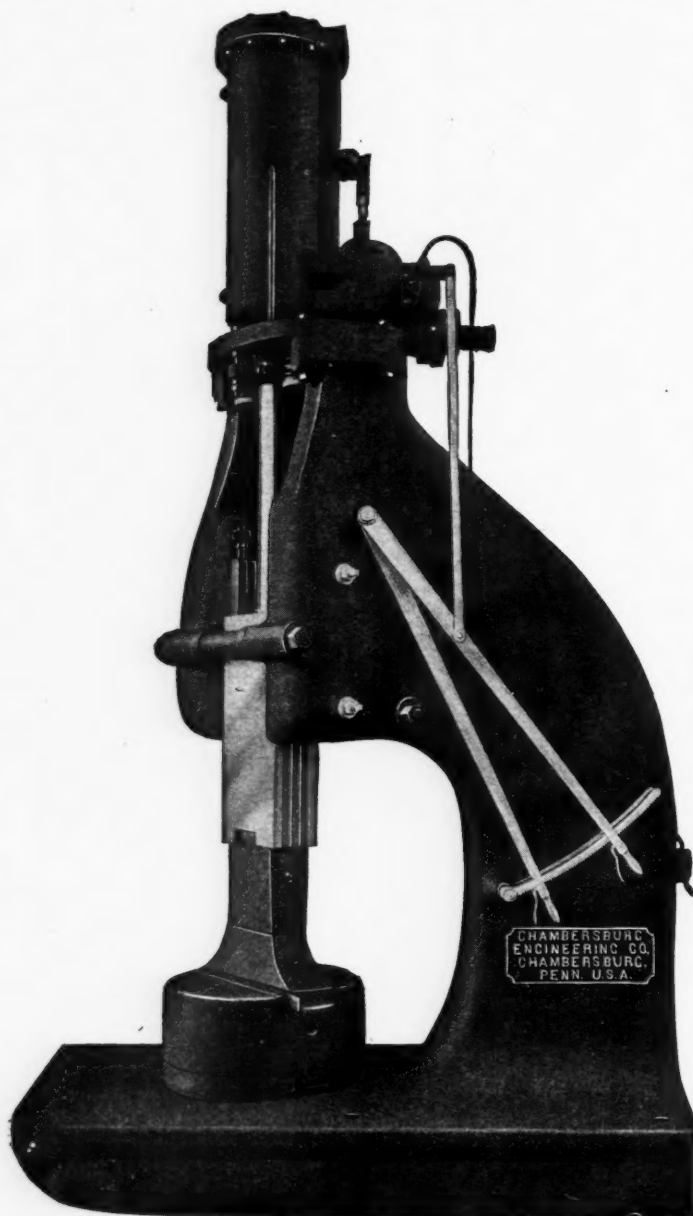
Section of Universal Copper Insulated Metal Sash.

One of the illustrations shows a cross section of Universal copper insulated adjustable metal sash, showing the application of Universal weather stripping. Another shows a lower corner of Universal copper insulated adjustable metal sash, equipped with No. 10 Gravity wedging sash locks. It also includes a section showing the application of Universal weather stripping to the sides and bottom of sash and the application of sash bead. The third is a section of a top corner of Universal copper insulated adjustable metal sash, showing adjustable sash balance chain connection.

Complete full sized models, with 51-in. window openings, are being exhibited at booths 655 and 657 in the annex.

**CHAMBERSBURG STEAM HAMMER.**

The illustration shows a 3,300-lb. Chambersburg single frame guided ram steam hammer, as designed and built especially for railway work. The distances from center of die to frame and from the underside of frame to the top of anvil die are extra large in order to provide clearance for locomotive frames; and it is for frame work that this type and size of hammer have proved most efficient. The frame is of massive section, made of air furnace cast iron, and is reinforced heavily around the guides. It is provided with steel tie bars, with distance pieces in front of and in back of the ram to strengthen the frame. The ram is long, to give increased bearing in the guides, and the guides are adjustable for wear of ram, being of the Chambersburg pattern. The valve gear is of simple and durable construction, and



**Chambersburg Single Frame Guided Steam Hammer.**

affords the operator accurate and easy control of his hammer at all times. It is double acting, taking both top and bottom steam.

The Chambersburg Engineering Company, Chambersburg, Pa., describes these hammers in its bulletin No. 44. The hammers may be seen in a number of shops of the leading railways.

**WRONG CONCLUSION.**

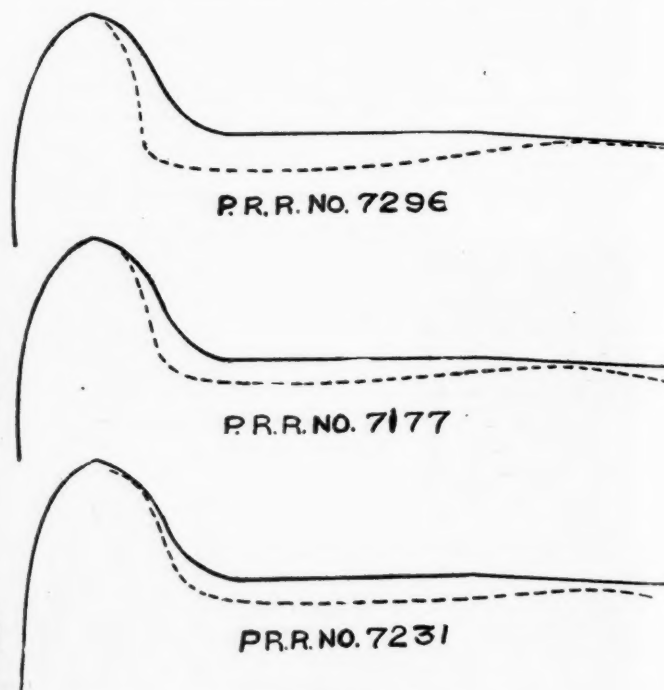
A. C. Moore was explaining some details of the Safety Car Heating & Lighting Company's exhibit to a party of railway officials Monday, when a thick cloud of smoke, caused by a flashlight photographer, rolled into the Safety Company's booth. The circumstance afforded one of the party an opportunity to remark, in a jocular spirit, that probably a Pintsch gas tank had exploded. Mr. Moore at once granted the remark was opportune, when made as a joke; but not otherwise.

This circumstance is the result of exaggerated accounts concerning train wrecks, which are often reported by poorly informed writers for the press.

Out of a total of 1,478 accidents reported in 26 years by the British Board of Trade, 14 were involved in fire. Of those 14 cases, only four could be assigned as due to gas—a percentage of .027 of the total number of accidents. Electric lighting is responsible every year for greater damage to buildings than can be attributed to gas; and the flame temperature of Pintsch gas is the lowest of all combustible gases. Pintsch gas is non-explosive when unmixed with air, and cannot be ignited when there is a mixture of less than 5 per cent. or more than 12 per cent. of gas. It is important that every effort be made to eliminate even the .027 per cent. of train accidents due to gas lighting; but when the total of 210,000 cars that have used Pintsch gas are taken into consideration, there remains very little reason for complaint against gas as a car illuminant.

**NICKELIZED CHILLED CAR WHEELS.**

A severe test of wheels made by the Nickel-Chrome Chilled Car Wheel Company, Pittsburgh, Pa., has just been finished by the Berwind-White Coal Company, and the cut shows the maximum and minimum wear after 2 1-6 years.



**Service Test of Nickelized Chilled Wheels.**

*Maximum and Minimum Wear on Tread and Flanges After More Than 60,000 Mileage.*

One hundred and fifty-six 33-in. nickelized chilled iron car wheels were placed, with steel wheels, under 50-ton Berwind-White coal cars, the heaviest mountain traffic in the country. The trains make 100 miles a day regularly, or 30,000 miles annually, as against 9,600 annually made by the ordinary freight. The service on this train had proved



too severe for the best standard chilled wheels, made from the approved car wheel mixtures, under the supervision of the most intelligent car wheel foundry practice, and the use of such chilled wheels was abandoned. After two years and two months 20 per cent. of the nickelized wheels have been withdrawn only on account of wearing out. No flanges gave way, and the service performed was in every respect equal to that of the steel wheel. There was no chrome in these wheels. Chrome adds greatly to mileage.

### CAR VENTILATION.

BY THOMAS H. GARLAND.

It is only within the last decade that car builders and railway car men have turned their attention to the importance of having passenger cars properly ventilated. The necessity of having all classes of railway equipment properly ventilated is now fully recognized, particularly in closed moving vehicles where the space is limited. The public demand for proper ventilation is now so strong that public conveyances cannot be constructed with the ventilation feature omitted. Formerly the only ventilation to be obtained in passenger cars was through the deck windows, or the opening of doors and windows. This means of ventilation was sufficient during the warm season, but in cold weather could not be used without producing strong drafts and discomfort to the passengers.

While there has been many devices patented for the purpose of producing ventilation in railway cars there seems to have been but little progress made towards a practical plan until the Pullman Company took up the subject in a systematic manner, with a view of finding a satisfactory means for properly ventilating their cars. As evidence of the thoroughness with which that company has gone into the subject, Dr. Thos. R. Crowder, superintendent of sanitation, has devoted several years to the collection of data and making exhaustive tests on Pullman cars and those of the various railway lines. The information obtained during this extensive investigation of the subject was presented by Dr. Crowder before the American Public Health Association at the annual meeting in September, 1910. This report has been reprinted under the title of *A Study of the Ventilation of Sleeping Cars*, and is the most complete treatise on car ventilation that has been produced.

At different times the M. C. B. Association has appointed committees to take up the subject of car ventilation; in each case valuable data was obtained, and each report has brought out many of the requirements necessary for good ventilation. The practical ventilation of cars, however, is yet to be taken up by many of the lines. The change from wood to steel car construction makes it more necessary to give the subject of ventilation careful consideration; particularly is this true with cars of the elliptical type, where deck windows cannot be used.

With the advent of the steel car and the tendency to make the doors and windows as nearly air tight as possible, the necessity for a practical ventilating system is becoming imperative. While numerous reports on car ventilation have been made at different times, and the subject is one that is frequently discussed, there seems to be an absence of practical tests with the different ventilating devices and systems, except for those made by the Pullman Company.

There can be only one way to determine the merit or demerit of ventilating systems, and that is by putting them into service on a number of cars and having extensive tests made by men familiar with this class of work. The committee on ventilation appointed by the Association of Railway Electrical Engineers is now giving this subject careful study, and the conclusions reached by this committee will be of practical benefit to the roads who desire to take up the matter of car ventilation. There is probably no one feature of car construction on which there is such a variety of opinions as to the manner in which

cars should be ventilated. Not only do officials, car men and trainmen hold different opinions, but the traveling public is always ready with suggestions how to properly ventilate the cars. Even among the medical fraternity there is a wide difference of opinion as to the part of the room or car at which the vitiated air should escape or be withdrawn and the fresh air admitted.

That passenger equipment must be provided with better means of ventilation than the standard deck sash, is now conceded by all of the railways. It becomes a matter of determining what is the most practical and efficient method to be used. Not only the first cost, but the cost of maintenance should be taken into account in investigating the various plans. It is usually thought that the ordinary deck sash is the least expensive means of ventilation; but a careful investigation may show that during the life of a passenger car so equipped, the expense for maintenance of deck lights, ratchets and screens is no small item. There are so many essential factors in the application of a practical system of ventilation, such as the relation to the heating system, the passing through tunnels, over deserts and through storms, avoiding drafts, excluding smoke, cinders, rain, etc., and the proper admission of fresh air, that the subject can only be dealt with by those who have given it long and careful study, or who are willing to do so.

### METALLIC SASH.

Forsyth Brothers' Company, Chicago, makes a number of designs of steel and brass metal sash. In designing the sash it aimed to produce one which, like the wood sash, would be more readily adjustable to variations in the window openings, would be dust proof, and provide a glazing adapted to glass of varying thicknesses and in which reglazing of the glass could be done without special instruction.

Among the company's other designs of metal sash is one in which the rails are quite narrow, affording a maximum area of glass and increasing the light in the car. The sash is sufficiently strong to stand all service.

Metal, and particularly brass, sash is coming into favor; not merely because of the finish which it gives to the car, but as a matter of economy in maintenance. The brass sash, by the action of the atmosphere, takes on a gun-metal finish which is permanent and which is not only pleasing to the eye but does away with the necessity, as in the case with the wooden sash, of removing the sash at intervals for re-varnishing. The work of removing wooden sash from a car, of handling, of re-varnishing, and re-adjusting it in the sash openings in the cars, involves a very considerable expense when the cars go through the shops. This is eliminated in the case of the brass sash. It is estimated that the cost of maintenance of the wooden sash alone will, in a comparatively few years, pay the cost of the brass sash. Along with other metal sash, Forsyth Brothers' Company furnish sash attachments, including weather stripping.

### MAXI-MILL VERTICAL TURRET LATHE.

Remarkable work in cutting cast iron is being done by the Bullard 42-in. Maxi-Mill, made by the Bullard Machine Tool Company, Bridgeport, Conn., and on exhibition at the Boardwalk end of Machinery Hall. It is removing about 1,700 lbs. of iron an hour from a casting 36 in. in diam. The cutter on the side head has been taking a cut  $1\frac{1}{8}$ -in. wide with a 1-16-in. feed, while the two cutters on the turret head are each taking a cut  $\frac{3}{8}$  in. wide with a feed of 1-12 in. at a cutting speed of 71 ft. a minute. Another feature is that the machine may be started or stopped under the heavy load while taking the cuts by simply operating a clutch.

## MOTOR CARS.

The Chicago Pneumatic Tool Company, Chicago, is showing, at its Atlantic City store, Boardwalk and Kentucky avenue, several types of its Little Giant commercial car. The latest, a bus, is shown herewith. It is being operated here in Atlantic City for the benefit of members and guests of the convention.

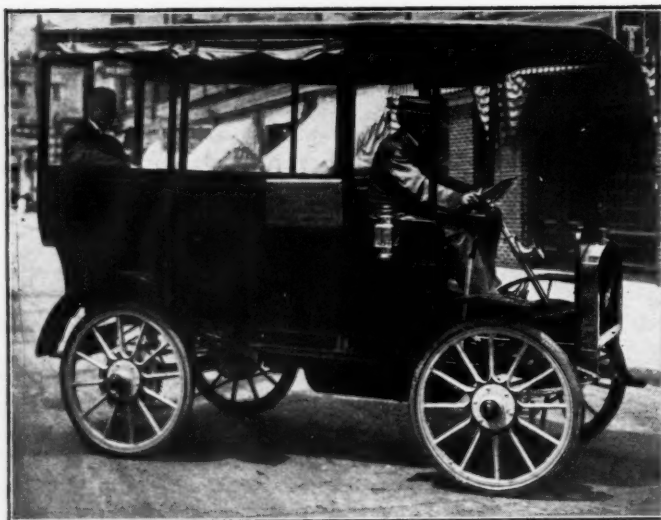
The Little Giant car is gasoline driven, with 5-in. x 4-in. 5 two cylinder, horizontal, four cycle, 20 h. p. engine, and is being operated over all kinds of roads.

The carrying capacity is 1,500 to 2,000 lbs., and it is furnished with an open box body, a canvas top body and a full panel top.

In the manufacture of this car, the Chicago Pneumatic Tool Company is following its custom of using only the best materials and workmanship, and has adopted those features which are essential to the successful commercial car—the water cooled engine, solid rubber tires and double side chain drive; and has designed this car to meet the requirements of general delivery service in all classes of business, from that of farmer to that of merchant.

The frame is of 2-in. x 2-in. x 1/4-in. angle steel, hot riveted together, and built to withstand the twisting strains of uneven roads and varying loads.

The power plant is on the sub-frame; and special attention



Little Giant Bus.

has been given to the general construction, so that all moving parts and wearing surfaces are readily accessible for adjustment or removal.

The motor is of rugged design, the right and left cylinders being cast from one pattern, with large water jacket, making it possible effectually to cool this powerful little motor by the thermo-syphon system of water circulation, and with force feed oiler, insuring complete lubrication.

Weight is an important factor in the construction of a commercial truck, and the Little Giant is designed to stand hard usage without carrying superfluous weight, which causes undue consumption of gasoline and lubricating oil. The Chicago Pneumatic Tool Company is adopting improvements as use and experience may suggest. The new Model C car embodies many of these.

The bus on the streets here is the first of that style and it is well adapted to such service, carrying eight to ten passengers, with plenty of space beside the driver for hand baggage, making it particularly desirable for station and hotel use.

The open body car or the canvas top car are suitable for baggage carrying as well as for other classes of delivery work. In fact, these cars are right for any load within their capacity of one ton.

## INCANDESCENT GAS LIGHTING IN TRAINS.

The following is from the *Journal of Gas Lighting and Water Supply*: Figures are given in the April issue of the *Revue Technique et Industrielle* showing the number of railway locomotives and cars in different countries of the world lighted by incandescent gas, and showing the large increase in this respect between April, 1908, and December, 1910. In view of recent railway (and other) accidents, these figures are eloquent as indicating the safety, popularity, and convenience of incandescent gas lighting on railways. Without attempting to give all the figures, we select the following:—

	No. of Locomotives and Carriages.	
	1908.	1910.
England .....	20,459	47,174
Germany .....	60,804	68,862
France .....	11,914	15,889
Holland .....	3,983	4,077
Austria .....	6,465	7,115
Russia .....	4,757	5,386
United States .....	31,392	33,286
Canada .....	1,626	1,885
Argentina .....	1,675	1,798
India .....	12,831	14,473
Australia .....	2,945	3,127

The statistics given indicate that, whereas in April, 1908, there were 164,432 railway vehicles lighted by gas, less than two years later there were 210,184 gas-lighted cars—being an increase of 45,752.

It is stated that the universal experience of railway companies is that incandescent gas gives a better and more constant light than electricity, at half cost, and with less expense in first cost and upkeep. This is shown by the following comparison:

Carriage equipment for electricity	4,200 to 4,500	francs.
" " " " gas	700 to 2,000	"
Annual maintenance for electricity	400 to 450	"
" " " " gas	500 to 100	"

## NATIONAL CURTAIN FIXTURES.

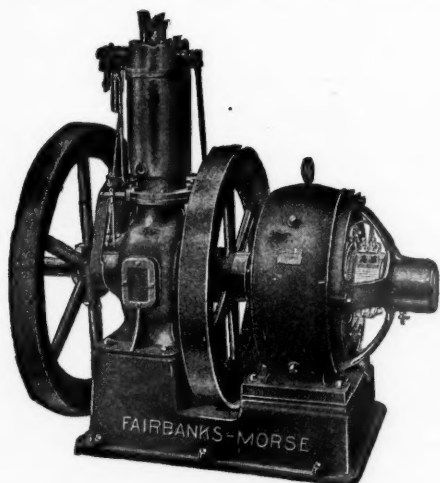
The National Lock Washer Company, Newark, N. J., is exhibiting its latest designs in curtain fixtures and curtains for both protected and non-protected grooves. The National cam (non-creeping) fixture is made of heavy steel tubing, with bronze heads and finger pieces finished in standard colors. The unique feature of this fixture is that the heads are stationary on the tube and all the holding is accomplished by moving cams at either end. This reduces to a minimum the possibility of the fixture coming out of the grooves and permits the use of light springs. The cams prevent the fixture from creeping, but permit the fixture to be operated without manipulating the finger pieces. The National C fixture for protected grooves has short solid brass heads of such design that they cannot be jammed in the grooves, and are practically self righting, making an ideal fixture for rough usage.

## GENERATORS FOR BATTERY CHARGING.

Just as the storage battery has developed as an important factor in railway signal operation, so has the means of properly and most economically charging these batteries been a matter to which signal engineers have given serious consideration. So important is this branch of railway operation that the Railway Signal Association has published specifications with which engines and generators used for this work must comply. Fairbanks-Morse & Company, Chicago, have had engineers at both their engine works and their electrical works make battery-charging outfits a matter of special investigation. This investigation was accompanied by work with the railways and with the signal association, and as a result they have developed special charging equipments. It is understood that they have installed these equipments to meet all conditions of service, including both stationary and portable apparatus, and covering a large



range in capacity. Some railways use their 600-volt equipments, while others use 160-volt equipments. In building battery-charging apparatus, economical operation has, of course, been as important a feature as perfect mechanical operation. The special electric engines for this work are now designed to operate, if desired, on the lower and less expensive crude oil dis-



Generating Set for Signal Batteries.

tillates. The cost of battery charging has, therefore, been wonderfully diminished. One of the light colored distillates can now be purchased at about one-fourth the cost of gasoline, and the cost of fuel consumption is about 75 per cent. less than when gasoline is used.

#### RELIABLE SHOP HOSE.

Such accidents as steam hose bursting or fittings blowing out usually happen, strange to say, when the power must be put in service immediately. Especially is this true in the case of the steam hose for blowing up engines in the roundhouse. This trouble is not quite so vital when it happens with the hose used in blowing off the engines, boiler washing, boiler testing or in pneumatic service, but the trouble is there just the same, and each delay means extra expense.

The armored hose manufactured by Sprague Electric Works, New York, and on exhibition in booth 386, is claimed to overcome the troubles of hose bursting or fittings blowing out. The armor is of the interlocking single strip type

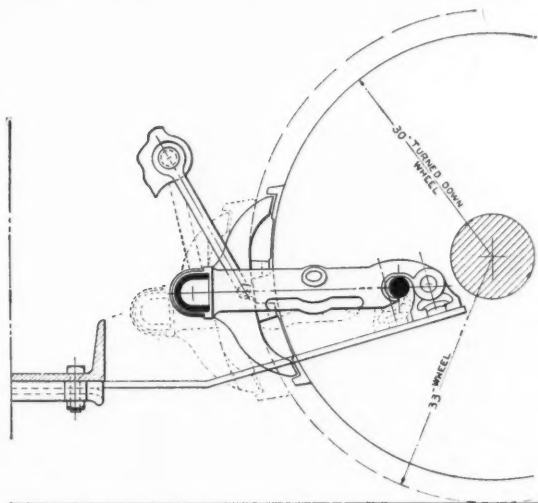
and is of sufficient strength to reinforce the hose so that it will stand a hydraulic pressure of 1,000 lbs. to 2,000 lbs., depending on the size of the hose. The fittings are constructed to withstand the same pressure. The hose cannot burst, due to the fact that there is no strain on the duck, and even when the rubber does deteriorate the result is only a small puncture of not sufficient size to cause trouble.

In addition to this feature, the armor affords protection from kinking and chafing, eliminates deterioration due to the expansion or stretching of the rubber hose—all lengthening the life—and is constructed so that the flexibility is equal to that of unarmored hose.

#### BRAKE BEAM SUPPORTS.

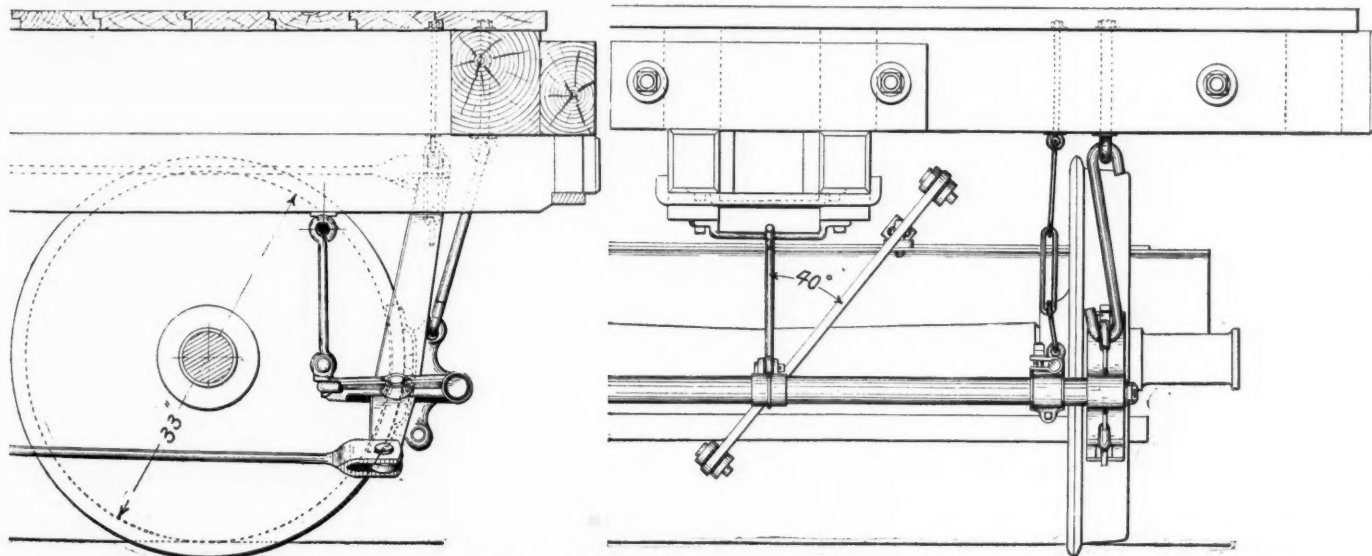
The Creco sliding third point brake beam support, made by the Chicago Railway Equipment Company, Chicago, is shown in the accompanying illustrations.

The makers of this device claim that it prevents the beam from tilting downward, does not pull against the forward



Creco Brake Beam, Showing Adjustments for Wheel Wear.

movement of the beam when brakes are applied with badly worn shoes, and protects the outer end of the beam in just the manner desired. It maintains a proper relation to the beam hangers at all times; is operative for beams of different strut depths on the same truck; does not prevent the beam from having such lateral movement as the brake hang-

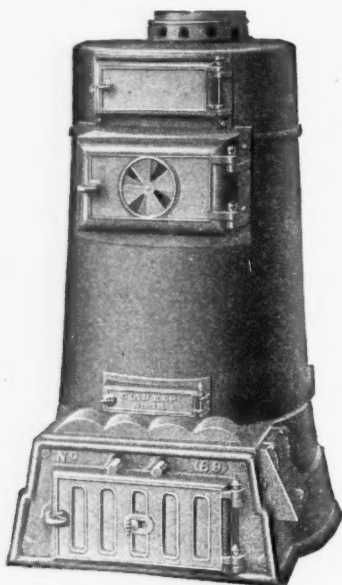


Creco Sliding Third Point Brake Beam.

ers allow; cannot throw the beam downward in case the underhung spring is bent, and cannot get twisted out of place. It does not get damaged so as to interfere with the application of the brake. It has the desired flexibility, broad bearing areas, economical features and can be more quickly applied or removed than any other design. It does away with the use of the second pin and cotter, heretofore used, and allows the use of the cheapest and simplest spring construction possible. It also allows for the reduction of rolled steel wheels from a larger to a much smaller diameter.

#### TANK HEATERS.

Hot water is being installed by some roads for heating switch towers. Sunray tank heaters, made by the United States Radiator Corporation, Detroit, Mich., are well adapted for that purpose and also for heating water tanks to prevent freezing in winter. These tank heaters are made in various sizes to meet any requirement. They have a deep firepot,



Sunray Tank Heater.

and are heavily built to stand heavy duty work. They can be installed quickly and at little expense and, it is claimed, will operate with a minimum of fuel and attention. They are equipped with all the conveniences of a boiler, such as clinker door, draft door, check door, etc. The deep firepot saves labor, as the heater will run 12 hours without attention.

#### ADAMS & WESTLAKE BASKET RACK.

Some basket racks for passenger cars as made in the past have projected only 11 or 12 in. from the side wall of the car. This is hardly enough for the large packages often carried

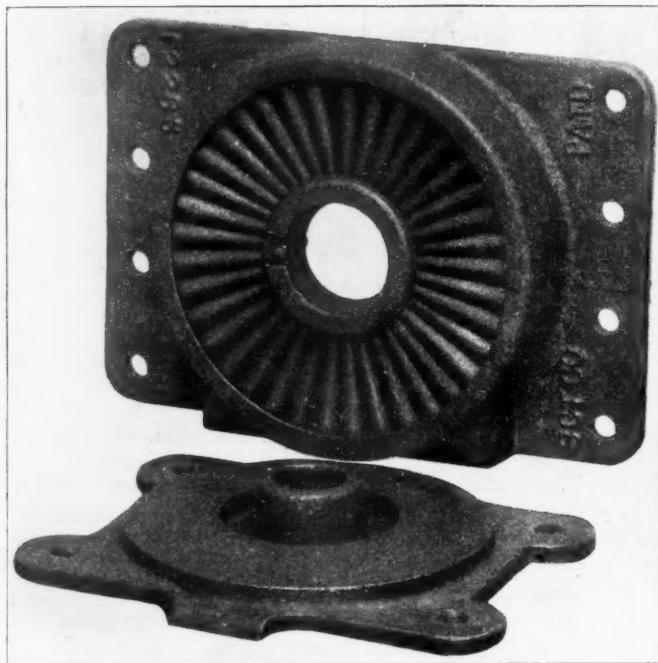


Adams & Westlake Wide Basket Rack.

by passengers, and for suit cases they are not safe, as the rolling of the car frequently causes them to fall out and hurt people. To improve the rack and prevent such accidents, the Adams & Westlake Company, Chicago, has designed the rack here illustrated. It is 14 in. wide, sufficient to hold large suitcases securely.

#### BARBER ROLLER BEARING CENTER PLATE.

The friction of center plates with flat bearings is usually sufficient to prevent car trucks from returning to normal position after passing curves, and the resulting flange friction adds materially to train resistance. One device for preventing friction under heavy pressure employs roller bearings, and the center plate here illustrated is made in that way. The plates



Barber Roller Bearing Center Plate.

are made of special hardened cast steel, and the rollers are drop forgings case-hardened. The Barber roller bearing center plate is made for all classes of cars and for locomotive tenders by the Standard Car Truck Company, Chicago, and is now in service in large numbers on several western roads.

#### STEEL PLATFORMS AND BUFFING MECHANISM.

There are three types of standard steel platforms and buffing mechanisms exhibited by the Standard Coupler Company, New York. Type F is a combined friction and spring buffing mechanism, especially designed for use on the new, heavy, steel passenger cars. It has a resilient or protective capacity of 400,000 lbs., and a movement of  $5\frac{1}{2}$  in. The buffer is designed so that when cars are coupled the resistance shall be just enough to keep the buffer face plates together, and the act of coupling the cars requires no excessive bumping. Behind the coupling point other springs engage as the travel is increased, until, to absorb the final shocks, all the springs and friction elements come into service. The friction elements, while increasing the protection or blow-absorbing capacity of buffing shocks, reduce the recoil or surging so as to make an easy riding train.

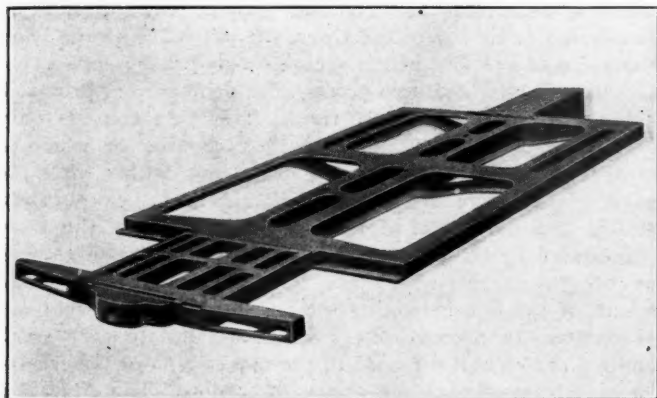
The type D buffer is designed for roads not demanding the high capacity friction buffer, but desiring a spring buffer of sufficient capacity and travel to absorb the less severe shocks of the extremely heavy cars. This spring buffer is so arranged as to couple with the least resistance, the heavier springs coming into play after the coupling is made. Both types F and D are designed for application to I-beams, to built-up structural underframes or to cast steel platforms. The type A buffer is the usual Standard Steel platform and buffer railways. Its resistance is less than either F or D,



but for the average passenger train service it is considered sufficient.

#### COMBINED PLATFORMS AND DOUBLE BODY BOLSTER.

The accompanying illustration shows the Commonwealth cast steel combination platform and double body bolster as made by the Commonwealth Steel Company, St. Louis, Mo.



Commonwealth Cast Steel Combination Platforms and Double Body Bolsters.

These castings bear the weight of the car body and form its foundation, providing a substantial resistance at the ends of the cars. Car construction is somewhat simplified by their use, and the many parts that must be kept on hand for repairing the built-up platforms are eliminated.

#### BETTENDORF ALL STEEL BOX CAR.

The Bettendorf all steel box car, made by the Bettendorf Axle Company, Davenport, Iowa, has an underframe of the regular Bettendorf type, is designed to carry the entire load and is similar to the underframe described in a previous issue.

The sides and ends, as well will be seen from the accompanying illustration, are made of panels flanged inwardly

from checkered plate pressed in a U shape and flanged to rivet to the roof sheets. This construction gives transverse and longitudinal strength and still allows for the torsion required of the car in rounding curves and for irregular track.

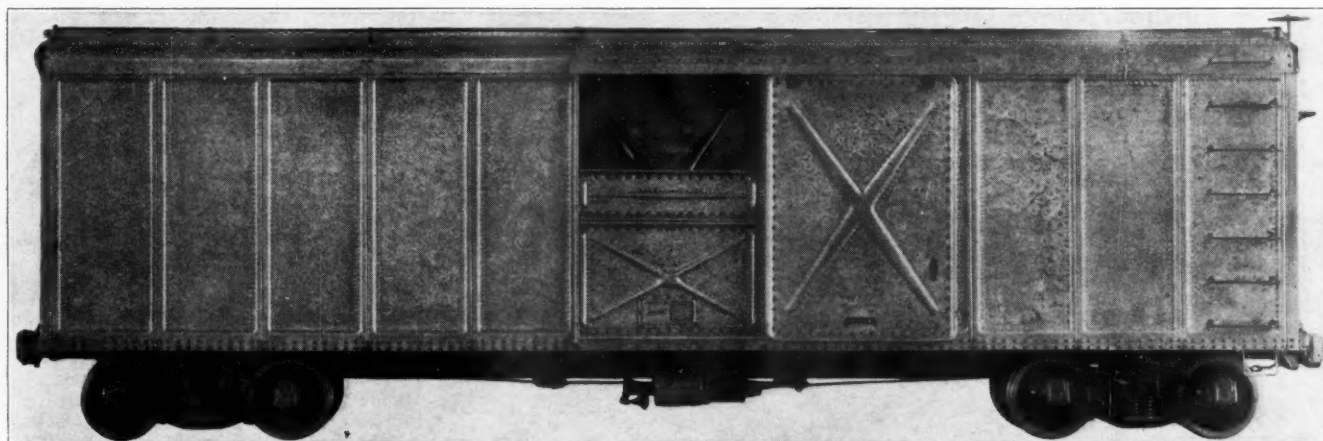
At each top corner of the ends is a specially designed ventilator, to prevent condensation upon the roof and side sheets, thereby keeping moisture off the lading and also preventing corrosion.

Steel end doors, side doors, grain doors and hatches are designed to meet the requirements of any service.

#### HIGH CAPACITY FREIGHT TRUCK.

The truck exhibited by the American Steel Foundries, Chicago, for freight equipment of 70 or 75 tons capacity is of the company's usual construction and is used on a number of railways. The parts of the truck manufactured by this company are: Andrews cast steel side frames, Davis cast steel wheels, cast steel bolster, Ajax brake beams and simplex bolster springs. The total weight of the truck is only 8,600 lbs., making what is claimed to be a lighter and stronger truck than would be possible with any other type of construction, for the following reasons: On account of the strength of the metal used in the manufacture of the Davis cast steel wheels it has been possible to reduce their weight to about 600 lbs. each. If it were possible to make a cast-iron wheel which would be suitable for a truck of this capacity such wheels would weigh not less than 850 or 900 lbs. each, and rolled steel or steel tired wheels would weigh even more. In the use of the Davis wheels, therefore, a reduction in weight of 1,000 lbs. per truck or 2,000 lbs. per car is obtained. The Andrews side frames weigh 500 lbs. each, or 1,000 lbs. per truck, making a saving of at least 250 lbs. per truck, or 500 lbs. per car, over any type of arch bar construction which could be considered. The cast steel bolster weighs about 1,000 lbs., the axles about 980 lbs. each and the journal boxes about 125 lbs. each.

In this truck the two side frames are held rigidly at right angles with the axles by a heavy channel spring plank which is riveted to each frame with 10 rivets, making a total of 20 rivets per truck. The truck tests recently made at the



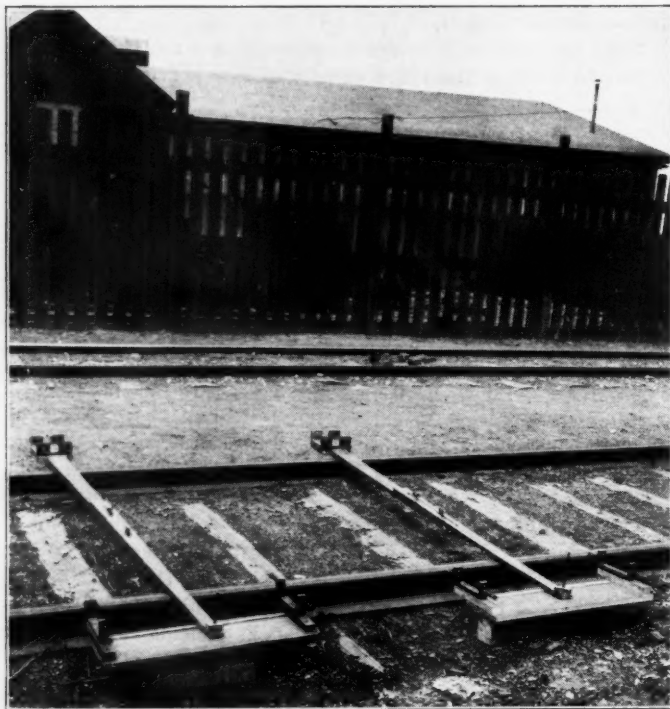
Bettendorf All Steel Box Car.

and riveted together on the inside of the car, which prevents corrosion at the rivets and facilitates the removal of the panels in case of damage by wreck.

The eaves are made of special rolled shape, designed to form a column along the upper edge of the sides and permitting of inside riveting. The roof sheets run longitudinally and are lapped over the eaves and each other. The running-board and ridge, which are in one piece, are made

Granite City plant of the American Steel Foundries, the results of which have been published in the *Railway Age Gazette* of March 24, page 691, and also in pamphlet form, show the necessity for a rigid fastening between the two side frames, to hold the truck square and prevent one side frame from getting ahead of the other when the truck is passing around curves. A loose truck or one with a spring plank connection which permits the wheels on one side to

get ahead of the others, allows the truck to become skewed in passing around curves, and it runs in this condition for a considerable length of time after the truck gets on a tangent. This causes the wheels on the outer side of the curve to grind against the rail, increasing the resistance of the truck and decreasing by a corresponding amount the hauling capacity of the motive power. Reduced to pounds



Gages for Measuring Loose Truck Variation on Curves.

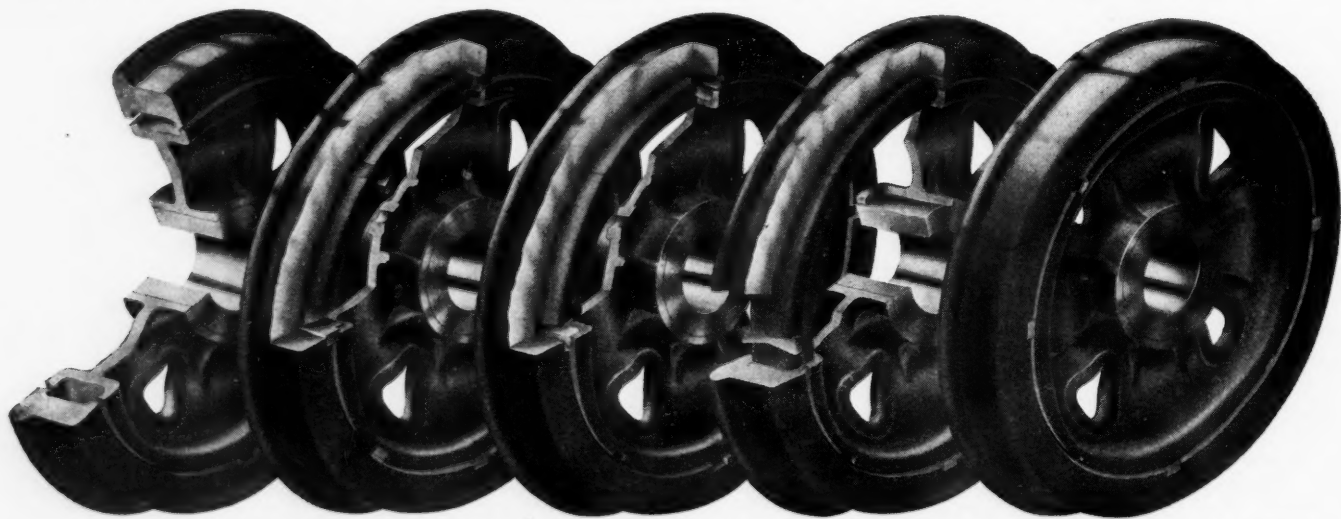
per ton, the Granite City tests showed a resistance of 38.33 lbs. on a 22 deg. curve for a loose truck, while for a square truck it was only 24.68 lbs., a difference in favor of the square truck of 13.65 lbs., or 35.6 per cent.

To push a loose truck around a 22 deg. curve required the combined efforts of from 5 to 7 men, while to push a square truck around the same curve only two men were required. A loose truck when it gets into a skewed condition disarranges the position of the wedges and brasses, causing

frequent breaking of the lugs of the brass. In order to determine quickly and accurately just how far any given truck will get out of square, a gage for measuring the distance has been designed, similar to the one shown in the accompanying illustration. The part of the gage with the long arm shown lying across the rails has a clamp with set screws at the far end which is securely fastened to the under side of the truck frame or tie bar as near the center as possible. The other end of the arm carries a lead pencil which is held in place by rubber bands. On the opposite side frame or tie bar of the truck, the part of the gage lying alongside of the first rail is securely clamped by set screws, and, as will be noted, two points of attachment are provided, holding the part absolutely rigid. This part consists only of a smooth piece of pine board on the top of which is tacked a piece of drawing paper or tracing cloth. After the parts of the gage are in position and the truck put into motion, any movement of one side frame ahead of the other is indicated by the line which is made on the drawing paper by the pencil carried by the long arm of the gage, the length of the line indicating the amount the truck went out of square. In practice one gage is attached to each truck under a car so that a record of the movements of the frames on each truck is obtained at the same time. The American Steel Foundries has one of these gages in its exhibit booth.

#### McCONWAY STEEL TIRED WHEEL.

The McConway wheel is on exhibition by the McConway & Torley Company, Pittsburgh, Pa., in spaces 617, 619 and 621. This wheel is of the built-up type, having a cast steel center, a cast iron hub and a rolled steel tire. The illustration shows the wheel in various stages of manufacture from the centering of the tire to the completed wheel. The only machine work necessary in making the wheel is such rough turning as may be necessary to true up the tire and a small amount of rough turning and grinding on the wheel centers. There are no bolts or rivets and the tire is neither fused nor shrunk on. The claims for this tire are that it cannot come off by reason of any amount of expansion, will not turn on the wheel center, and when the original tire is worn out it can be removed and a new one applied, the salvage in the scrap value of the old tire being enough to pay for the cost of removal of the wheel, the application of the new tire and the replacing of the wheel on the axle.



1. Tire Center and hub assembled; the next operation is the casting of locking wedges into the space shown between the tire and rim of the wheel center. To perform this operation, the wheel is laid flat and the molten iron is poured through annular opening on the side.
2. Locking wedges shown in the first position, the temporary spacing wedges not being removed.
3. Temporary spacing wedges removed and the locking wedges driven home, the points of wedges being about—but not quite—in contact, and the final spaces left between large ends of the wedges.
4. Sprags in place and the final closers cast, showing the projecting ends of the sprags which engage in the inner flange of the tire to prevent the tire revolving on the wheel center.
5. Completed wheel.



# Railway Age Gazette

DAILY EDITION

Vol. 50. NEW YORK—JUNE 21, 1911—ATLANTIC CITY. No. 24c.

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE, BY  
THE RAILROAD GAZETTE (INC.), 83 FULTON ST., NEW YORK.CHICAGO: 417 South Dearborn St. CLEVELAND: New England Bldg.  
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published from time to time in New York, or in places other than New  
York, payable in advance and postage free:

United States and Mexico.....	\$5.00
Canada .....	6.00
Foreign Countries (excepting daily editions).....	8.00
Single Copies .....	15 cents each

Shop Edition and the eight M. M. and M. C. B. Convention Daily Issues,  
United States and Mexico, \$1.50; Canada, \$2.00; foreign, \$3.00.Engineering and Maintenance of Way Edition and the four Maintenance  
of Way Convention Daily issues, North America, \$1.00; foreign, \$2.00.Entered at the Post Office at New York, N. Y., as mail matter of the  
second class.

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PROBABLY the most important act of the M. C. B. convention this year was the vote instructing the committee on couplers and draft equipment to design a single standard M. C. B. coupler. The discussion on the report of this committee, which led up to this vote, was also of far-reaching importance, and disclosed a condition in coupler practice which is not creditable to the railways that are buying couplers not in accord with the M. C. B. specifications. It was also made clearly evident that the present conditions, which provide only standard coupler lines and permit a variety of knucklers and locks, have become so burdensome as to be intolerable. The present standard dimensions for couplers are not adequate for the severe

service of hump yards and Mallet locomotives, and it is necessary to make radical changes in order to increase the strength of the coupler. It is also necessary to increase the length of the coupler head or the shank in order to comply with the United States safety appliance standards for end ladder clearance. The discussion showed that a majority of the speakers were in favor of making the increase in the head, as this offered opportunity for improving the locking device and strengthening the head, though it does produce a heavy overhang on the carry-iron. The severe conditions of modern freight service, as well as the federal regulations, have thus brought about this important action of the association, which will lead to the adoption of its own standard coupler, and it is not too soon to begin work on the new design which will be required by law five years hence. The weakness in the present coupler head in not meeting severe freight requirements is one which will be difficult to overcome if the coupler is not protected by buffers, and the more economical design must have some reference to this protection. The use of buffers in connection with couplers should, therefore, be one of the requirements for cars in the ore and coal traffic. This convention must be regarded as truly an eventful one, when the importance of the action on couplers is fully realized.

HERE is an interesting exemplification in the supplementary report on refrigerator cars of the difference between ordering a thing done and doing it. The committee was directed to produce a non-freezing drip that would be applicable to refrigerator cars. After a year's effort it came before the convention and announced its belief that a compliance with the order is a mechanical impossibility. The frankness of the admission should carry due weight and turn attention in other directions. Meanwhile, it forms a precedent for dealing with other snarls that the railways would like to have untangled.

THE report on safety appliances was merely a statement of conditions that have developed during the past year. The discussion hinged on the details of the application of the announcement on the car, as to whether it complies fully or in part with the standards prescribed by the Interstate Commerce Commission. It is gratifying to note that the Master Car Builders' Association acted along the same lines as to safety appliance regulations as did the Master Mechanics' Association last week as to the boiler inspection law. It accepted without qualification the agreement made by the railway committee with the Commission's inspectors, that the lettering, or badge plate, should state that the car was equipped in accordance with the "U. S. Safety Appliances." It was pointed out that if the whole were to be abbreviated to "U. S. S. A." it would occupy less space and be just as intelligible to an inspector. But that was not what was agreed upon, and, until the proposed or any other modification of the wording has been accepted at Washington the association felt that it would not be justified in indorsing any modification whatever. The regulation as it stands is a gentlemen's agreement. No penalty attaches to disregarding it. But if it should be disregarded, it is quite possible that the government might tighten the screws on the railways. It remains for the individual roads to act in harmony with the stand the association has taken. For the good of the railways it is necessary, not only that the law should be obeyed, but that agreements like that regarding the badge plate should be carried out to the letter.

TWO important details connected with air brake equipment the hose coupling and its gasket, are treated in considerable detail in the report of the committee on train brake and signal equipment. It fortunately reaches the point where it is able to recommend a standard air brake hose coupling which was first proposed in 1909, and a standard

gasket for these couplings, which will insure greater protection against leaking and lessen the damage to hose when pulled apart than is now possible. The coupler gaskets supplied by the two air brake companies are not alike, and those bought in the open market have such a variation in their dimensions that when a large number were inspected by gages less than 10 per cent. of them were found to be fit for service. This is a condition which is responsible for a large amount of train line leakage; it has continued too long and should be speedily corrected by the adoption of the standard hose coupler and gasket, which are now recommended. We have used the term "gasket" in preference to "packing ring," as printed in the report, as that seems to more correctly define the "rubber ring in question." Packing rings are usually associated with a moving piston or plunger, while the rings of copper, rubber or other plastic material which serve to make a tight joint in two abutting surfaces are usually termed "gaskets." It is suggested, therefore, in the further consideration of this new standard, that "gasket" be used in preference to "packing ring."

THE committee on car wheels came very close to giving the cast iron wheel a rub equalling that of President Curtis in his address to which allusion was made yesterday. It calmly assumed that the steel wheel was the wheel to be considered. Of course, in strict literalness, this is perhaps straining a point. There was a communication from the wheel makers urging modifications, principally in the direction of greater weight for the cast iron wheel, and in the report there are recommendations that belong to the manufacture of the wheel but the interest seems to center about the steel wheel. The paragraphs at the end of the report were brief, but the discussion hinged on them, and the committee was called upon to explain why it favored a 33-in. steel wheel instead of one of a larger diameter whose mean size should be 33 in. The discussion on the strength of the wheel that has been so notable for the past few years was entirely lacking, and there seemed to be a tacit though unexpressed agreement that the steel wheel is to be used on high capacity cars. It is a revolution in sentiment that has taken but a short time to accomplish, and is probably due to causes already indicated in these columns coupled with the drop in the price of the new product.

THE way in which the story of Saturday's baseball game was handled in *The Daily* of June 19 having elicited many compliments and also numerous expressions of surprise that a technical paper could cover such an event in such a way, has moved us to tell our readers that the entire job, except the making of detailed memoranda of the moves of the players—for which our thanks are due to the official score card keepers—the taking of part of the photographs and the purely mechanical work of engraving and printing—and even a portion of the latter—was done by members of our own staff. The story and the captions on the cuts were written, all the photographs excepting the six largest, were taken, the drawing on the cartoon pictures was done, and the engraving of the cuts and making up of the matter in the pages was directly supervised by men regularly connected with this paper; and even the type and cuts were put into the forms by the make-up man who does this work on the weekly edition of the *Railway Age Gazette* in New York, and who was brought down to the Philadelphia printing plant where *The Daily* is being turned out for the purpose of making it up. However surprising it may seem, there really is nothing surprising at all in the fact that our staff can turn so easily from getting out a technical paper to getting out a baseball edition. Its flexibility is due to the varied experience of its members. For example, two of them had years of experience in the editorial departments of metropolitan newspapers in Kansas City and Chicago; the artist who did the sketching for

the baseball story and who is now connected with the *Railway Age Gazette's* advertising copy service, also was formerly connected with daily newspapers, and a fourth staff man is an expert amateur photographer. Past experience has led us to the conclusion that there isn't anything journalistic under the sun that our boys will not merely tackle, but achieve, from dissecting a Mallet or covering a prize fight to describing a lady's gown or giving the railway managers all the details of how to run their business!

#### LEAKAGE OF AIR BRAKE EQUIPMENT.

AT the last convention of the Air Brake Association the most of one day's session was occupied with a paper and discussion on the leakage of air brake cylinders and various methods for preventing it, and while it was suggested that the subject should be further investigated by a committee which would consider the various improvements which had been suggested by manufacturers and bring the subject before the M. C. B. Association, no definite action was taken, and an opportunity was lost for the performance of an important work.

Exact measurement is always helpful in showing the extent of any defect and in developing improvements. Air brake cylinder leakage has been regarded as a defect inherent in the brake system, but it was not until the use of an air gage was made a part of brake inspection equipment that the full extent of it was realized and more serious measures taken to correct it. Now it is found necessary to obtain better material for the leather packing of the brake cylinder, to improve the design of the expander ring, to give more attention to uniform lubrication of the whole circumference of the cylinder and to be careful to use a lubricant which does not contain corrosive acids which destroy the leather.

In the light of present knowledge it is pardonable to criticize and doubt the results of air brake tests which were made without knowing the condition of the brake cylinder packing or the extent of the leakage, for this must have had an important effect on the brake power developed and its gradual reduction throughout the stop. The brake cylinders on locomotives are located in a warm place where the packing is liable to dry out rapidly and when the engine is over a clinker pit the radiation from red hot coal must so heat the cylinder as to make it dry out both the leather and lubricant. It is a question whether brake cylinders so located should not be provided with metallic packing rings which would not be so seriously effected by intense heat.

Other causes of leakage which have been too long neglected are the various forms and qualities of the hose coupling gaskets. The shapes of these rubber gaskets as used by the two principal brake companies are not alike and they are used indiscriminately; as that of one company does not exactly fit the coupler of the other company there is some leakage due to this lack of a perfect joint. The gaskets are sometimes made of cheap material which hardens or easily becomes distorted, and again the joint is defective. Some canting of the hose coupler is due to the freezing of porous hose which become soaked with water and which, when frozen, is so stiff that the couplers are slightly drawn apart. This causes leaks at the gaskets.

The inspection of air brake hose under pressure by covering it with soapy water is a ready means for detecting spongy hose and should be more generally used. The M. C. B. committee on air brake equipment in its report this year has made some recommendations looking toward the adoption of a standard form and dimensions for air brake hose gaskets, with specifications and tests for the material.

In the design of the new Westinghouse control valve it was found necessary to make special provisions against leakage, as slight vents in this delicate mechanism interfere with its proper functions. The air pump itself is required to supply such a large volume of air that any leakage in its packing or valves renders



it less efficient, and when it is required to keep reservoirs on a 10-car train having total contents of 150,000 cu. in. charged to standard pressure, any leakage in the pump will increase the time of charging and cause unnecessary wear in maintaining the pressure. The late improvements in the air-brake equipment have fortunately been such that a smaller volume of air is required for the application of a given brake power, but the increased demand for more brake power, due to the increased weight and speed of trains, makes it necessary to guard carefully against leakage in every part of the equipment. This is a feature which is now receiving unusual attention and it will repay the most careful investigation.

#### TO-DAY'S PROGRAM.

##### M. C. B. ASSOCIATION.

##### Discussion of Reports on:

Rules of Interchange.....	10:00 A. M.
Prices for Labor and Materials for Steel Cars.	
Consolidation of Master Car Builders' and Master Mechanics' Associations.	
Springs for Freight Car Trucks.	10:30 A. M. to 11:00 A. M.
Lumber Specifications .....	11:00 A. M. to 11:15 A. M.
Train Lighting and Equipment..	11:15 A. M. to 11:45 A. M.
Train Pipe Connections for Steam Heat .....	11:45 A. M. to 12:00 M.
Unfinished business; Reports of Committees on Correspond- ence, Resolutions, and such other committees as may be named during the convention....	12:00 M. to 12:15 P. M.
Election of Officers .....	12:15 P. M. to 1:30 P. M.
Adjournment.	

#### FOUND.

Masonic pin, Shriner. Prove ownership at the office of Secretary Conway.

#### NEW PURCHASING AGENT ON THE TEXAS & PACIFIC.

The appointment of C. Ludolph as purchasing agent of the Texas & Pacific is announced in a circular issued by T. J. Freeman, first vice-president.

#### SUPPLY MANUFACTURERS' COMMITTEES.

President Stafford, of the Railway Supply Manufacturers' Association, has announced the following appointments of officers and committees for the conventions of 1912:

Treasurer—Herbert I. Lord (re-elected).

Secretary—John D. Conway (re-elected).

Finance committee—Charles P. Storrs (chairman), A. C. Ashton and George N. Riley.

Exhibits committee—J. Will Johnson (chairman), E. H. Walker, John R. Blakeslee and Frank J. Lanahan.

Badge committee—E. H. Walker (chairman), Samuel Allen and Lucien C. Brown.

Entertainment committee—Philip J. Mitchell, chairman. (Mr. Mitchell will name the members of the committee at some future time.)

Enrollment committee—Oscar F. Ostby, chairman. (Mr. Ostby will name his committee later.)

Transportation committee—George S. Stuart, chairman. (The makeup of the committee will be prepared later by Mr. Stuart.)

## Proceedings.

President Curtis called the second session of the Master Car Builders' Association to order at 9.40 Tuesday morning.

#### RULES FOR LOADING MATERIAL.

The committee has no recommendations for changes in the present rules for loading material, except to correct some errors, for the most part typographical, that were made in the last issue of the rules. This conclusion has been reached as the result of the few changes that have been suggested during the current year, and more especially in order to give every one handling the rules more time and better opportunity to make up their minds what changes are really necessary.

It was a mistake allowing Rule 26 to go into the 1910 issue of the rules in its modified form. The rule should read:

"The cars must be jacked apart by placing one jack on each side of the coupler, separating the cars until the couplers are pulled out to the fullest extent, inserting hardwood or metal blocks (latter preferred) to completely fill the space between the horns of coupler and end of sill, and coupler



A. Kearney.

Chairman, Committee on Rules for Loading Materials.

release-rod chain disconnected, as shown in Figs. 2 and 3."

We have been asked to consider the rules governing the loading of rolled material of small sectional area, Rules 98 to 103, inclusive. The suggestion has been made that there seems to be the necessity for distinction in the use of center binders on loads of flexible material, pointing out those loads requiring center binders and those which do not. In fact, it has been intimated that it might be more advisable to confine the use of center binders only to the loading of small angles, channels and I-beams, and possibly setting a limit for sizes of this material which would require center binders. It is the opinion of the committee that, for the coming year, definitely specifying the application of center binders to flexible loads is a question on which its experience is too limited to distinguish, and for that reason the rules governing the handling of this material remain unchanged in this respect. The members of this association are earnestly requested to advise the committee during the coming year what based upon their experience, they would recommend for limits of size and shape of parts for twin or triple loads of flexible material which would require center binders.

It has been suggested that possibly Rule 121, governing the loading of cylindrical boiler shells and tanks, be studied with a view of reducing the height of side blocking to a minimum consistent with safety. To do this would require more information than the committee's experience and advice from the various roads at the present time afford; therefore, the rule will remain unchanged for the present, and any modification will depend upon such advice and experience in handling that the various roads may submit.

Attention is called to the correction of several typograph-

ical errors in the last issue of the rules. They appeared principally in the rules for handling pipe, chiefly with respect to the illustrations showing a greater number of strands of wire binders than is called for by the last revision.

The changes are as follows:

1. The first three lines of Rule 112, page 97, should read: "There should be not less than three pairs of stakes to each pile when the material is 20 ft. or less in length."

2. The next to last paragraph in Rule 112, page 97, beginning, "Intermediate wiring need not be used—," Change 2 ft. to 3 ft., making the paragraph read: "Intermediate wiring need not be used when load is less than 3 ft. above car sides."

3. The title above Fig. 59, in plan, page 101, should read: "Loading one length of all pipe or tubing 12 in. or less in diameter in gondola cars—Rule 112 shows whether three or four pairs of stakes should be used."

4. The clause between the plan and elevation views of Fig. 59, page 101, should read: "Six strands or three wrappings of wire, good  $\frac{1}{8}$  in. in diameter."

5. The clause between the plan and elevation views of Fig. 60, page 103, should read: "Six strands or three wrappings of wire, good  $\frac{1}{8}$  in. in diameter."

6. The clause above end view, Fig. 61, page 105, should read: "Six strands or three wrappings of wire, good  $\frac{1}{8}$  in. in diameter."

7. Change ten strands wire to six strands wire, Figs. 57 and 58.

8. Cut out reference to Fig. 20 in note at bottom of Fig. 21, page 52. The note would then read: "10 by 12 in. minimum for double loads when bearing-piece must be bolted through floor and cleat, as shown in Fig. 22."

9. Last line of Rule 109, reading, "paragraph 99," should read, "paragraph 104."

It is reasonable to suppose that physical conditions and requirements bring up problems locally which are met by excellent suggestions for changes in the rules. Some may be of minor importance, while again others are of considerable moment. These oftentimes valuable remedies seldom reach us, hence we are at a disadvantage, because the committee less posted perhaps, in some local situations, is endeavoring to make general and specific rules for the guidance of all. It is not reaping the benefit of the many good ideas arising in handling commodities under the local conditions, which knowledge would greatly tend to increase the efficiency of the committee. The committee is endeavoring to bring about a plan by which it can derive the benefit of the broader experience, so that the rules will be still further increased in their efficiency and integrity.

The report is signed by:—A. Kearney (N. & W.), chairman; R. E. Smith (A. C. L.), Wm. Moir (M. & I.), W. F. Kiesel (Penn.) and L. H. Turner (P. & L. E.).

#### DISCUSSION ON RULES FOR LOADING MATERIAL.

A. Kearney (chairman of committee): Outside of the few errors or additions the committee have asked to be added to the rules, there would not have been very much to report this year. It is asked, therefore, that the committee be allowed to make the changes in the rules—I refer to the errors—and that the rule 121 be submitted to letter ballot. During the year we have had correspondence with Mr. Arthur Hale of the American Railway Association in reference to the apparent conflict between our rule No. 6 and A. R. A. Rule 15. The committee has not felt that it could consistently change the rule with the information it has had, but after talking the matter over with Mr. Lucore it is believed that the rule can be made harmonious, without giving up or altering any principle in either case. That matter will come up this afternoon at the meeting of the arbitration committee and it can very readily be corrected.

J. J. Tatum (B. & O.): You will remember that last year considerable discussion occurred in connection with the metal spacing blocks—under Rule 26, as it formerly read, it was optional whether we used metal or wood spacing blocks. This year the report reads "inserting hardwood or metal blocks (latter preferred)," etc. Why should the word "preferred" be added there, considering the action of the convention last year. I think that word is superfluous. I will further say in connection with the matter that if we allow that to remain we will be obliged at interchange points to give defect cards for metal spacing blocks. If we allow this matter to remain as presented by the committee, a road receiving a car with metal spacing blocks may remove them and put wooden spacing blocks in their place. I think the matter should be definite and not left optional. In order to dispose of such condition as that, I move that we have the rule as it formerly was, that it be optional whether we use metal or wooden spacing blocks. I think it is important that it should be left in that form, without a statement being made that metal is preferable.

Mr. Kearney: I understand this simply erases the word "preferable?"

The President: Yes.

Mr. Kearney: We had considerable trouble with that rule. Some three years ago I thought a metal block would prevail, but we found later on that it was not satisfactory and that we would have to allow the wooden block. However, it was thought by the committee that the metal block was preferable, hence it was put in that shape. It is entirely satisfactory to the committee if the convention wishes to erase the word "preferable" and allow either; but the majority of the roads prefer metal blocks.

F. F. Gaines (Cent. of Ga.): I think, gentlemen, that the question whether you are going to use metal blocks or wooden blocks is entirely one of locality and a question of loading and one that each road has got to thresh out for itself. Roads that are running in a territory where iron and steel is abundant, prefer to use metal blocks, but if you have a branch line in a sawmill territory, where metal splicing block could not be obtained, why, it would be necessary to use wood. I think there has been some misunderstanding about the use of the word "preferable." In some cases it has been taken to imply that a defect card should be put on whenever you use a metal block or a wooden block. I think we better just simply say "wood or iron."

(Members called for the previous question.)

Mr. Tatum's motion was carried.

C. A. Seley: I move that Rule 121 go to letter ballot. The motion was carried.

#### COUPLER AND DRAFT EQUIPMENT.

The standing committee on coupler and draft equipment submits the following report for the year 1911:

*End-ladder Clearance*:—Numerous inquiries were received from the members relative to the question of redesigning the M. C. B. Standard coupler to provide the necessary end-



R. N. Durborow.

Chairman, Committee on Coupler and Draft Equipment.

ladder clearance on existing freight-equipment cars to comply with the United States safety appliance standards. The committee has considered this question in its different phases and calls attention to the fact that the association is confronted with a serious problem in the resultant effects, both to the railway companies and the manufacturers, unless a proper solution of the matter is made at this convention. It is believed that the most satisfactory way of meeting the conditions imposed is to adopt one, or not more than two, temporary standard automatic couplers, so as to provide for the necessary end clearance as affecting present freight-equipment cars.

This proposed new coupler could be designed by lengthening the shank or by increasing the length of the head between the coupler horn and pulling face of knuckle; either of which would probably introduce conditions contributory to bending of shanks and breaking or buckling of center and end sills, due to the increased length of lever arm. The idea of gaining the required space by lengthening the shank should be dis-



couraged, as it involves changes in the end construction of the car and a greater liability of bent coupler shanks, and the committee believes that the clearance required should be gained by changing the present standard distance between inside face of knuckle and striking horn of coupler.

It is desired that in thus providing for what may be termed an emergency condition that the coupler and draft committee by no means intends to deviate from any fruitful results obtained by the association in the past years, but rather to permit the introduction of this proposed coupler to meet what is nothing more than a temporary need. It should be kept clearly in mind that this emergency coupler is not to be placed on any new equipment, but is merely an expedient to meet a required condition. This change in coupler head would increase the number of M. C. B. standard couplers. In order that the number of standards may be kept to a minimum, the members should advise the committee promptly the amount of increase in length of coupler necessary and the number of cars requiring this increase. When these replies are received it will enable the committee to decide whether it will be necessary to care for more than one additional temporary coupler. It should be borne in mind that it will be necessary to carry these emergency couplers in stock at all repair points, so as to maintain the proper end clearance when making repairs.

**Reinforcement of Key Slot:**—By referring to Sheet 23, M. C. B. proceedings of 1910, it will be seen that the dimension for the thickness of the reinforcement of the key slot on the 5-in. by 7-in. coupler is  $1\frac{3}{4}$ -in., and on the 5-in. by 5-in. it is  $1\frac{1}{2}$ -in. Various manufacturers have brought this question to the attention of the committee, also the fact that there is a tendency for shrinkage cracks, which weaken the wall of the coupler shank at the point of the present V-shaped reinforcement. This has been investigated, and the committee recommends that the thickness of the reinforcement on the 5-in. by 5-in. coupler shank be made  $1\frac{3}{4}$ -in., and that the reinforcement on both the 5-in. by 5-in. and 5-in. by 7-in. couplers be changed in design to conform with these recommendations. Attention has been directed to the comparatively short life of the contained parts within the coupler head, because of early failure under service conditions. The M. C. B. specifications for automatic couplers state: "The couplers furnished under this specification must be made of steel, etc." The breakage failures above mentioned were found to be due, apparently, to material other than steel having been used for the parts within the head.

The evident intent at the time of formulating the above specifications was clearly to consider the contained parts within the head as included in the word "Coupler." Results from present practice leads the committee to think that the use of any other material than steel for these parts is undesirable, and it is suggested that the first paragraph under specifications for M. C. B. automatic couplers, as given on page 728, 1910 proceedings, have this sentence added, viz.: "The word 'Couplers,' as here used, includes the bar itself and the contained parts within the head, such as locks, knuckle throws, etc."

**Drop-test Machine:**—Difficulty has been experienced when making face tests of couplers, due to the bending and breaking of the set-screws used for holding the coupler in place. The set-screws also become so tightly wedged in the base block that it becomes necessary to drill them out. In view of the above conditions, it is suggested that the use of set-screws be abolished and the filter blocks and wedges to be used for holding the coupler in place when making such tests. This will necessitate recessing the base block. The committee has tried out this arrangement and finds it to be an improvement over the set-screws.

**Purchase of Couplers:**—At various times the attention of the committee has been called to the fact that the M. C. B. specifications have only been complied with in varying degrees on the part of the manufacturer, and likewise there has been considerable latitude allowed by some of the railways in the matter of their insistence that couplers purchased should meet the prescribed M. C. B. specifications. Accordingly a circular letter was sent to the members of the association, embodying the questions given below:

1. Do you purchase couplers in accordance with the M. C. B. specifications?
2. Do you have your own specifications, and if so, what are they?
3. Do you purchase couplers without specifications?
4. If you are not using the M. C. B. specifications, will you kindly give your reasons?
5. Have you any changes to suggest in the M. C. B. specifications for automatic couplers?

Replies to the above questions were received from 43 railways, and of this number 36 replied affirmatively to question No. 1. From the replies of the other seven railways it was

noted that some purchasers do not require the face test, others rely entirely upon the manufacturer's integrity and some purchase in such small quantities that apparently the M. C. B. specifications are not insisted upon.

In replying to question No. 2, 32 railways advised that they adhere to the M. C. B. requirements, while 8 railways stated that they purchased couplers according to their own specifications, which in most cases were practically the same as the M. C. B. requirements.

Question No. 3. Forty railways answered negatively, and three stated that they purchased couplers without specifications.

Question No. 4 was replied to by five railways, stating that they did not use the M. C. B. specifications, claiming that their own were better.

Question No. 5 brought out the following suggestions:

1. That all manufacturers provide themselves with proper testing apparatus.

The committee would advise that this is covered by the present coupler specifications.

2. That the key slot be made  $1\frac{3}{8}$ -in. wide so as to permit the use of a  $1\frac{1}{4}$ -in. key.

The committee does not approve this suggestion.

3. That an  $8\frac{1}{2}$ -in. butt end be made standard.

That an  $8\frac{3}{4}$ -in. butt end be made standard.

This was rejected by letter ballot in 1910, and in the opinion of the committee it is undesirable to increase the number of standards.

4. That the face test either be properly enforced or that it be replaced by the guard-arm test previously used.

The committee is satisfied that the introduction of the face test has largely reduced the face breakage which was experienced in the past. Some criticism has been made relative to the severity of the present face test, and it is the intention to conduct another series of tests during the coming year to ascertain whether any modifications are necessary. The committee does not approve of the replacement of the face test by the guard-arm test.

5. That paragraph 7 be changed so as not to require serial numbers of manufacturer on draw bar.

The committee does not approve this suggestion.

6. That knuckle pins must bear a manufacturer's mark.

The committee approves this suggestion, and recommends that its identification mark be placed on head of pins.

7. That dimension at bottom of coupler shank (Sheet 23) reading "12-in. no projection here," be increased  $\frac{1}{8}$ -in. forward toward head of coupler so as to increase shank clearance at carrier iron.

The committee approves this suggestion.

8. That a paragraph covering the bottom operating coupler be incorporated into the specifications.

The committee does not approve this suggestion, as it is inadvisable to increase the number of standards.

9. That the knuckle pin be increased from  $1\frac{1}{8}$ -in. to  $1\frac{3}{4}$ -in. in diameter.

The committee does not approve this suggestion, as this can not be done without weakening the knuckle lugs of the head.

10. That the  $8\frac{3}{4}$ -in. dimension from inside face of knuckle to striking horn of coupler, as shown on Sheet 23, be changed to  $9\frac{1}{4}$  in., as indicated by note.

The committee does not approve of this suggestion, as the  $9\frac{1}{4}$ -in. dimension is for new types of couplers introduced after January 1, 1909.

11. That the severity of the pulling test be increased.

The committee believes that this test can be safely increased, and will conduct tests to determine to what extent the present requirements should be increased.

12. That it is desirable to purchase knuckle pins according to chemical specifications.

The committee does not approve this suggestion. The present physical test largely determines the chemical composition of the knuckle pins.

13. That a lug at coupler-yoke gib be made standard.

The committee does not approve this suggestion.

14. That a minimum weight be established for couplers.

The committee does not approve this suggestion, as they are not in a position to set any definite figures.

15. That a distance be given from center line of coupler to center of knuckle-pivot pin.

The committee will take this recommendation under advisement. At present this is taken care of, to a certain extent, by the contour lines of the coupler.

16. That the line shown for the minimum distance knuckle should open should be properly located.

The committee would refer the member to Sheet M. C. B. 23, which now takes care of the point raised.

As outlined in the report of the previous year, it was the intention of the committee to conduct the draft-gear tests

and make report to the 1911 convention. It is regretted, however, that the building of a test machine, as proposed, was prohibited by the large expense involved, and the committee can, at this time, do no more than reiterate its previous position in the matter, with the idea of carrying on the proposed tests as soon as the proper testing apparatus can be procured.

## SUMMARY.

A summary of the recommendations which the committee offers to be submitted to letter ballot, to be adopted either as standards or recommended practice, is as follows:

**Standards:**—1. That the key-slot reinforcement for the 5-in. by 5-in. coupler be made  $1\frac{3}{4}$  in. in thickness, as shown on Sheet A, and that the V-shaped reinforcement on both the 5-in. by 5-in. and 5-in. by 7-in. coupler be changed in design, as shown on Sheet A.

2. That the specification for M. C. B. automatic couplers, as given on page 728, 1910 Proceedings, have the following sentence added after the words "Must not be painted," in the fourth sentence from top of page, "The word couplers as here used includes the bar itself and the contained parts within the head, such as locks, knuckle throws, etc."

3. That knuckle pins must bear a manufacturer's mark on head of pin.

4. That dimension at bottom of coupler shank, Sheet 23, reading "12 in., no projection here," be increased  $\frac{1}{2}$  in. forward toward head of coupler.

**Recommended Practice:**—That the use of set-screws, shown on Sheet J, 1909 Coupler Report, for holding the coupler in place when making drop test, be abolished; that filler blocks and wedges, shown on Sheets B and E, be used instead of the set-screws, and that the base block, shown on Sheet I, 1909 coupler report, be changed to conform to that shown on Sheet C.

The report is signed by:—R. N. Durborow (Penn.), chairman; G. W. Wildin (N. Y. N. H. & H.), F. W. Brazier (N. Y. N. H. & H.), F. F. Gaines (C. of Ga.), F. H. Stark (Pitts. Coal Co.), H. La Rue (C. R. I. & P.) and H. L. Trimyer (S. A. L.).

The report was read by Mr. Stark.

## DISCUSSION ON COUPLER AND DRAFT EQUIPMENT.

Mr. Stark: I presume the question of the emergency coupler will be of more interest than any other feature of the committee's report. The question as to whether the necessary increase is to be accomplished by increasing the length of head or by an increase in the length of shank is a question which should provoke a free discussion. The overhang will be practically the same no matter whether it is accomplished in one way or another, and also the effect on the center sills and longitudinal sills. The tendency to shank failures would not be increased by increasing the length of coupler shank except where cars are equipped with very substantial buffer blocks, in which case the car frame, of course, would absorb more or less of the shocks and relieve the shank, but the buffer block is a rather indefinite quantity. In the near future it will be necessary to consider the whole proposition of coupler design and capacity. It is a question whether we ought not at this time to take into consideration the length of the coupler shank, as it is now the coupler yoke in some cases comes in contact with the end sill construction. To increase the shank and reinforce it in proportion would give you more longitudinal travel. This would enable the friction draft gear to dissipate the shocks to a great degree in proportion to the increased travel. To make a radical increase would, of course, increase the overhang which would be detrimental.

There is one feature about increasing the shank, which is important, and that is to make it possible to increase the connection between the coupler yoke and the shank—whether that is necessary or not, is a question for this body to determine. As it is now the coupler shank is short and oftentimes you have to cut away the end construction of the car to provide for the longitudinal travel, and I believe that the question of length of coupler should be considered not only in connection with the emergency coupler but in connection with the coupler of the future. This is a matter of vast importance, and I believe the coupler committee would court suggestions and the only way in which to work this out will be by making tests of couplers of various designs, so far as reinforcing the head or the shank is concerned.

F. F. Gaines (Cent. of Ga.): As a member of the coupler committee, I have affixed my signature to the report, but there are one or two items in the report concerning which I am not altogether in harmony with. In the first place, the committee turns down the recommendation that the  $8\frac{1}{2}$  in. butt be made standard. Last year that failed to carry by only 12 votes, and it looks to me as if it was too close a vote on which to turn down such a recommendation, and that it should be again sub-

mitted to letter ballot. The  $8\frac{1}{2}$  in. butt is used all over the country. Everybody must have them in order to make repairs, and it should be made standard. In regard to the temporary coupler, I have been looking at a coupler recently on exhibition here having  $11\frac{1}{4}$  in. between the face of the knuckle and the striking point, and it is not a bad looking coupler. The overhang does not look anywhere near what you might think it is. It gives more room for the lock, for increasing the strength of the walls, and backs up the guard arm in better shape than the  $9\frac{1}{2}$  in. head. I would like to suggest, for the earnest consideration of this association, not making a temporary coupler with say a 2 in. increase of the head, but making a permanent coupler, so that there will be only one coupler. I do not believe that we are going to make any mistake in increasing that head.

F. W. Brazier (N. Y. C. & H. R.): As a member of the coupler committee I signed the report in order to bring it before the association. But referring back to this report I would say: It is to be regretted that conditions have arisen so that there is any question relative to the necessity of having a different length coupler. For one I would be opposed to having more than two lengths of couplers. In the report you will note it is to be called a temporary standard coupler, and is not to be used in any new equipment. In other words, new equipment will be built so as to conform to the United States Safety Appliance Standards, using our present standard coupler. I feel that unless this association takes a decided stand the different roads will write the coupler committee and there will be a large number of recommendations as to different lengths of couplers. We might as well decide at once that there should not be but one additional length of temporary coupling.

In the convention of 1904 I suggested that a committee be formed to report the desirability of having a coupler designed standard so that the knuckle locks and other parts of the coupler would all be interchangeable. The coupler committee of 1905 recommended that a special committee be appointed to work in connection with the coupler committee. In the convention of 1906, the committee on the composite design of coupler, of which I was a member, made its report and great stress was then laid on the fact that none of the manufacturers were willing to give up their patent rights and surrender them to the association; also it was the opinion of the railway representatives of the committee that it was not in accordance with business ethics to ask the manufacturers to surrender their rights without compensation and the Master Car Builders' Association is not a body which can properly acquire rights of this character and sell them or give them to manufacturers, without rendering itself liable to charges of unfair discrimination.

It was also agreed by the committee that if we only had three or four kinds of couplers there would be less cause for complaint than at the present time. This committee concluded its report by commending that no couplers be purchased by railway companies unless they meet with the requirements of the M. C. B. Association and recommendations of the standard committee on tests of M. C. B. couplers and in this way the elimination of all couplers which do not fulfill the requirements would soon be affected. I am quoting the above to show the feeling at that time. I feel the time is come, and the experience that we have had with couplers is sufficient, so that we should get down to one standard design of couplers. My reasons are as follows:

We have to carry so many different parts of couplers in stock to maintain the different kinds that it is great expense to the companies, a serious delay to freight and on a loaded car marked out for broken knuckle or knuckle lock of a coupler not standard to the line on which the failure occurs it is necessary, in order to make repairs, to remove the entire coupler and apply a new one complete. This means the application of a coupler not standard to the car. I find that the road I represent has in the past few months been compelled to order a little over 10,000 knuckles of 39 different makes; about 7,000 knuckle locks of 21 different makes; 246 knuckle lifters of different makes, and so on with other minor parts of couplers.

In these days of economy when we are trying to keep our stock low, you can readily see what it means to have so many different kinds of couplers to maintain. Recently we had a statement made showing the number of second-hand freight couplers on hand that we were holding for repair to be a total of 2,015; 1,547 we were holding for knuckles; 1,435 of the 2,015 for locks, and the balance for other minor parts. This represented 26 different makes of couplers. From my viewpoint this is all uncalled for—the railway companies represented in the association could have a special committee, or the coupler committee meet with the coupler manufacturers and, without doubt, a design of coupler could be agreed upon that would meet all the requirements. I feel positive about this point, as I have taken it up with several of the prominent coupler manufacturers, and I am assured that they would be willing to get together and settle this point.



The second plan would be to have the coupler committee given power to design a coupler that meets the requirements, and that the association pay the necessary expense; then we would have a coupler with a knuckle that would be interchangeable for all couplers, and reduce the cost of our stock many thousand dollars a year, and also would save the delay of trains. A coupler arrangement should be provided at the same time, that would be operative either at the side or bottom and stop the trouble we are having with the top uncoupling arrangement. After 15 years of experience we know that either bottom or side uncoupling arrangement can be made absolutely satisfactory.

At the present time, when one of these numerous couplers, which are not standard to our own lines breaks, we either have to set the car off, or possibly in some cases use an emergency knuckle, and under the Safety Appliance Law no two cars could be coupled together with them; neither could we interchange this car with a foreign line with an emergency knuckle in, simply because we have not a knuckle that would fit the coupler. Now, what is the result? This car goes to the repair track. The coupler is taken out. A coupler is put in that we have in stock. Then, rather than to throw away the foreign coupler, which was removed, we order a knuckle and hold the coupler body until we get the knuckle, which may be any time from 1 to 4 months. These are facts, and occurrences of this kind are happening every day on our roads. It is time that this association should wake up and take some action. I could give a great deal more data on this subject. I have the facts and figures with me showing the expense this means to the railways throughout the country as well as those I am representing.

I wish to repeat what I have said before, that there is no reason why this one design of coupler cannot be brought about and be interchangeable the same as journal bearings, oil boxes and other parts of cars. I am told that it will stop competition. It may be very interesting to the members of this association to know that to-day there is no competition in couplers. The coupler manufacturers have apparently devised means whereby the couplers are all one price, so the argument of competition is the same in either event. I believe that we should give this subject more attention and more discussion than ever before in view of the alleged inefficiency of railway methods to which so much publicity has been given. I believe that a duty rests directly on this association now, and I certainly believe that this can be brought about at the present time better than at any time in the past.

J. F. Deems (N. Y. C. & H. R.): I want to say just a few words on this subject. First I desire to emphasize what Mr. Gaines has said in regard to making this coupler with new dimensions standard instead of making it merely a temporary coupler. I cannot see any reason why we should be jealous of retaining the old standard dimension for the coupler. I fear the association has gotten into the habit of considering a dimension once established a sort of fetish and that it is well nigh sacrilege to depart from it. We seemed to have thought that for a great many years in regard to safety appliances, but we have departed from it now. Of course, we know that it would add something to the weight of the head, making it a little more difficult to carry on the carry-iron, but as I understand it, the gain that we will obtain in regard to strengthening the walls and giving a better opportunity for the locking device will much more than compensate for that, and I do not see why we are starting out now with this coupler and calling it a temporary coupler, and thus introducing two kinds of couplers and perpetuating them for years and years. It does seem to me, as Mr. Gaines has stated, that we should go to work at this coupler with the utmost care and then it should be made the standard coupler.

I also want to emphasize what Mr. Brazier has said. It does seem to me that the time has come when we should have a Master Car Builders' coupler, not a Master Car Builders' type of coupler. I have talked that at conventions and otherwise for the last five or six years, and I firmly believe that if we do not do that, if we do not make a standard coupler, we will be invited and compelled to make it. I know there is a great deal of discussion going on now in regard to insisting upon roads using one kind of coupler; and, as Mr. Brazier has said, in the face of the severe criticism that the roads have been subjected to on account of their lack of proper management and so forth we cannot very easily defend such a ridiculous situation as he cited if we admit that the Master Car Builders' Association is unable to design a coupler. If we can do that, why, let us do it, and if we do it, let us use it.

I believe that this subject of couplers is one that should be taken in hand at once, and I cannot see any reason why it should be doled along through three or four years before we come to

any lasting conclusion about it. We have all used the M. C. B. coupler in its various forms long enough to know pretty nearly what is required, and I firmly believe we should take some action to-day looking to an early solution of the question. It may be that there are some members here who can advance some good reason why this coupler should be made temporary; I think Mr. Seley is one of those who thinks it should be made temporary, but I cannot see it that way; I cannot agree with him. Then instead of a standard contour line, I think if this association does not take some action about that at an early date it will probably be required to do so.

J. J. Hennessey (C. M. & St. P.): I fully agree with the gentleman who has last spoken on this subject. I believe we have arrived at the time when we should have a standard coupler. At the same time I believe we ought to raise a committee to meet with the coupler manufacturers, and say to the coupler manufacturers that regardless of their so-called patents—and there are very few of their patents to-day that are valid on couplers—and say that one coupler must be designed, and the different manufacturers should waive all questions of patents and get down to a fair manufacturing profit. That is practically where it is to-day.

J. F. Walsh (C. & O.): It seems to me this discussion this morning, with respect to couplers, is strongly opportune. As I remember the matter, the present M. C. B. type of coupler, the contour, the knuckle, the general design of that coupler was adopted a number of years ago when the bulk of our cars were very much lighter in capacity than they are to-day. About the time that type of coupler was adopted it became fashionable to take off the buffer block, and we have been buffing with that unfortunately weak coupler, until I know of one case where one car had 8 couplers in a year. In connection with this matter of couplers, would it not be well to arrange to adopt some form of coupler that would constitute not only a coupler, but a substantial buffing device in connection with the coupler. I think it would be a good plan, as Mr. Deems said a moment ago, if we do not go into this matter some one will go into it for us. The M. C. B. Association ought to endeavor to bring out something in the way of an M. C. B. type of draft rigging. The draft rigging we have to-day provides the same strength for pulling as it does for buffing, and we know that is wrong.

C. E. Fuller (U. P.): If I understand the committee's report correctly they disapprove of cutting out the 8¾-in. coupler, and I would ask the chairman of the committee or some other member of the committee, what their objection is to cutting out the 8¾-in. and going to the 9¼-in. coupler?

C. A. Schroyer (C. & N. W.): There are 39 couplers to-day, and by putting in these different standards, you make 39 times 39 couplers.

Mr. Fuller: We are getting away from the 8¾-in. coupler, and yet the committee objects to cutting out that coupler and going to the 9¼-in. coupler, if I understand the report correctly. I think we ought to get away from the 8¾-in. and go to the 9¼-in. and thus reduce the number of standards.

S. M. Hindman (Penn.): The reason the 8¾-in. coupler was left there, is, that the 9¼-in. dimension simply takes care of the couplers designed after January 1, 1909. You have these two standard couplers in existence, and the 8¾-in. coupler will be in existence until it is worn out and scrapped. You must take care of them until that time.

Mr. Fuller: You do not have to manufacture any more of them?

Mr. Hindman: No; that specification says that all couplers manufactured after January 1, 1909, must have 9¼ in. dimension.

Mr. Fuller: In reference to this discussion, it seems to me that the question with this association taking action on matters pertaining to standards is not only a question of getting down to a standard, but it is important from a commercial point of view. I am afraid we have all been disposed to try to keep too many things in existence. We have had the M. C. B. coupler for a great many years, and it is now further from a standard coupler than it ever was before, and five years from now it will be still further from being a standard coupler. I think Mr. Brazier's remarks are to the point, and this is a question that this association should take very careful note of. We cannot longer continue to defend our position in regard to the M. C. B. coupler. If we are worthy of being called the mechanical representatives of the railways, we certainly should have sufficient ability to get down to a standard. There does not seem to be any more reason for having to carry 8, 10 or 20 different kinds of knuckles for our couplers than there is for carrying 8, 10 or 20 different kinds of brasses. We have a standard brass which will interchange and go into any car, and we

should have the same thing for the coupler; and the sooner we take action the stronger will our association be, and I for one feel that this association has got to get down to rock bottom, and the members must forget a lot of their personal opinions and adopt a standard M. C. B. coupler after giving the matter full consideration—to consider the matter fully and know we are right and then adopt something that will be a credit to the association. I think we should use whatever is the standard,  $9\frac{1}{4}$  in. coupler on all new cars, but the old cars are going to be in operation for a good many years to come, and we will probably have to use the  $8\frac{3}{4}$  in. coupler on those cars. You must remember that even if we take action on this coupler question at this time it will be five or six years before we reap the benefits of it, and the sooner we begin on the matter the better.

Mr. Schroyer: The thought that comes to my mind in connection with this coupler question is this—that it is very much more important to this association and to the railways of this country that we should have a coupler in which the same knuckle would be operative. Now, the difference between couplers is in the difference in the shape of the knuckle and the knuckle arm, and the difference in the locking and unlocking apparatus in the side of the head. All the patents which exist to-day on couplers are in connection with these details. If we could require that a coupler be constructed in which the same knuckle could be used, regardless of what the uncoupling attachments may be, or the uncoupling or locking apparatus may be, we could under our rules, as they exist to-day, buy one style of coupler for our own use, and under our rules we could put that style of coupler into any car that came into our possession in which we had a broken coupler. Our greatest difficulty to-day in the maintenance of couplers is in the knuckle, not in the coupler heads themselves, because we can soon work out a coupler head, but the knuckle question is the difficult one, and we are required to carry in stock all the different kinds of knuckles that Mr. Brazier referred to. We do not want to stand in the way of progress in the way of a coupler, but I think we should say to the inventor—you must invent a coupling in which a certain kind of knuckle will be operative, and your locking attachments in the head must be operative from an upper or lower connecting rod, and if we could secure these things I think the difficulty would be reduced to a minimum, and we would not be standing in the way of progress in the development of coupler construction.

H. L. Trimyer (S. A. L.): As a member of the coupler committee I wish to say that I telegraphed authority for my signature to be appended to the report, but as Mr. Gaines has said, in regard to himself, I will say for myself, there are many things in the report which do not exactly meet my views. In the first place, I am in favor of one standard coupler. While I cannot agree with Mr. Schroyer that all the troubles are in the knuckles, I will say that the troubles we have developed are in the knuckle pins, coupler locks, faces and guard arms. We have some conditions existing in our territory that have led me to believe that the coupler should be entirely redesigned. The coupler, as stated by Mr. Walsh, was designed years ago for comparatively light capacity cars, and tests I have actually made lead me to believe that the present contour lines are not just right. We have a large number of failures of knuckles, locks, and knuckle pins are also failing in a great many of our cars, and we have a few failures of the guard arms. We have some conditions existing on two of our connections, practically new roads, running up into mountainous territory, operating 75 to 100 car trains, and experience with the couplers on those trains has led me to believe that the present coupler is wholly inadequate for the service.

I have discussed this matter with a great many coupler manufacturers and they have agreed that the present coupler is not of sufficient capacity for that service. As Mr. Gaines stated, I believe that we require additional space in the head of the coupler to enable us to strengthen up those parts that are failing, and I am in favor of increasing that distance so as to give us an opportunity to strengthen the locks, knuckles and knuckle pin, and there is no reason why we should not design a coupler that shall meet all of the requirements both in regard to the large hump yards; the difficulties experienced around the coal tipples and bad track conditions which are responsible for a great many coupler failures at the present time, and I for one am in favor of the committee making some effort to adopt a standard coupler.

G. W. Wildin (N. Y. N. H. & H.): I move that the committee be instructed to design an M. C. B. coupler and present it to the next convention.

Wm. Garstang (C. C. C. & St. L.): I offer this amendment to Mr. Wildin's motion: That the committee on coupler and draft equipment be authorized to take up with the coupler manufacturing companies the matter of redesigning the coupler, and

invite them to join the M. C. B. committee in the designing and adopting of one standard freight car coupler.

Geo. Gibbs (Penn.): In fairness to the coupler committee I think they should be given some sort of guide as to what is required. I think in the case referred to by Mr. Trimyer, they are hauling trains with two or more Mallet engines ahead, which stretch the couplers out of shape. If two Mallets will not do it, three or four will, and if they keep putting on these Mallet engines on their trains in these numbers, they will pull all their couplers out of shape and have no end of coupler failures. I think the committee should have instructions as to whether they should design couplers to be used in trains hauled by 2 Mallets or 10 Mallets—unless they have instructions of this sort it will be difficult for them to perform the work assigned to them.

The President: Mr. Wildin, will you accept Mr. Garstang's amendment?

C. A. Seley (C. R. I. & P.): Do I understand this authority conferred on the coupler committee will permit them to depart in all respects from the present standards of the association if in their judgment it is desirable to do so? I think the committee should be authorized to proceed regardless of present standards.

Mr. Garstang: My motion will allow the committee to use their own judgment in that matter.

Mr. Seley: I do not mean the present standard—of course, retain the contour line until that has been changed.

H. L. Trimyer: In answer to what Mr. Gibbs has said, I would like to say that actual tests made with one Mallet engine and fifty 50-ton steel cars, clearly demonstrated that the present coupler will not meet the service required.

I want to say this was not an investigation made by the coupler committee; it was an investigation made by us on account of some conditions we experienced up there. In gaging 596 cars with a  $5\frac{1}{2}$  in. gage between the guard arm and the knuckle there were only 132 cars that would pass, and I believe every one of us here will be greatly surprised if we take a gage and start through our yards, if we follow the rules, to see how many cars we will have to send to the tracks or take the coupler knuckles and locks out to make them come to a  $5\frac{1}{2}$  in. gage as required.

I. S. Downing (Ill. Cent.): It would be interesting to know from Mr. Trimyer's remarks whether these couplers were old, worn couplers that had been in service that did not meet the test, or new couplers that were pulled out of shape.

Mr. Trimyer: The test was made on cars which had been on the road from four months to four years. We have actual figures—while I have not them with me, they can be shown to the coupler committee—which show that couplers which had been in service 41 days were out of gage according to the M. C. B. requirements.

W. F. Bentley (B. & O.): I would inquire whether the couplers referred to were all gaged to know whether or not they conformed to the M. C. B. requirements or came up to the gage before the test was made.

Mr. Trimyer: The cars were assembled together and gone over and gaged before test was made.

Mr. Schroyer: Regarding this getting out of gage, let me say that I am very sorry that anything of that kind should have gotten into our record. It is a condition which, if it does exist, is certainly very alarming, and we sometimes get wrong ideas as to why certain things are being done by this association. At the time a gage was established to be used for knuckles and draw bars we used the short guard arm, and much trouble was occasioned in cars becoming uncoupled because of the gage passing the guard arms, but it was due to the bending of the light  $1\frac{1}{2}$  in. knuckle pin and the wearing of the wearing face of the knuckle. Those were the causes that prompted the use of a gage. The extension of the guard arm  $1\frac{1}{4}$  in. has been almost entirely done away with that difficulty of cars becoming uncoupled on the road. On our road we are using that gage all the time, and I believe the majority of the principal roads of the country are using it. Where we find cars that are out of gage we have them corrected. If the bars in such cases fail to the extent that is mentioned, it is questionable in my mind as to how we can get bars that will stand. We certainly cannot do it with the present contour lines.

Mr. Trimyer: I very carefully considered this before saying anything about couplers getting out of gage, and I came to the conclusion that possibly we had gone a little too far in keeping these things quiet. I was greatly surprised to find how many couplers would not pass gage requirements.

Mr. Bentley: I would say that the most of the difficulty that we find is with the knuckle pin. We have established a rule on the B. & O., where we gage all couplers, and the most of our trouble seems to be with the knuckle pin being



bent, or possibly sometimes the knuckle pin hole is worn, thus permitting the coupling to get out of gage. As Mr. Trimyer says, I think there is quite a number of them that we find out of gage, and frequently we are able to bring them up to the standard by applying a new knuckle pin.

Mr. Walsh: I think we have simply outgrown the conditions that the present type of coupler seems to have been gotten up for. Nine years ago we had one thousand 50,000 lbs. capacity cars, and to-day we have twenty-five thousand such cars. Nine years ago the tractive power of our freight locomotives was about 30,000 lbs. To-day it is 90,000 lbs. We have taken off our buffers and we are doing our buffing now with the couplers, and the knuckle pins of course have got to stand it. So you see we have outgrown the conditions that those couplers were made for, and I think it is high time for us to design something that will meet the conditions that we have got to deal with now.

The President: Mr. Wildin's motion is before the house. Are you ready to vote upon it?

Mr. Garstang: Before the vote is taken, Mr. President, I desire to say a word. On account of having been connected with car building for many years I think I appreciate the work that this committee has got laid out before it. Now, I think if we can get a committee of this association and a committee of the manufacturers to meet and let them get up one standard coupler it will solve the problem, and I think they should have assistance—indeed, it may be necessary to employ a mechanical engineer to work out the problem for them—and I would, therefore, suggest that this association appropriate to the committee a sufficient amount of money to carry on that work.

Mr. Deems: I heartily endorse that suggestion. I think we are approaching a very critical period in this coupler matter. What Mr. Trimyer has mentioned is going on all over the country, and this committee with the many duties that its members have to perform cannot, as individuals, take this work up and handle it as it should be handled, and it seems to me that they ought to have the money, and arrangements ought to be made so that they can employ a mechanical engineer to assist them in the detail of the work.

Mr. Stark: I desire to say on behalf of the committee that we have no objection whatever to working at a standard coupler. The demand has arisen from the membership of the association for a temporary coupler, and we are by no means wedded to the present standard; but there is a large expense involved and the committee has no appropriation or authority to spend a large amount of money in the working out of a satisfactory coupler and I think this association ought to provide for the committee in that respect. It has been expressed here to-day that these couplers are failing. I think possibly one reason of that may be that so many of them are purchased without specifications. To bring about a standard coupler is going to be a pretty hard proposition. It is a question, too, whether we want just one single standard. You will have no means of comparing one design with another. It is a large subject. As Mr. Schrover has said, if it can be worked out so that one knuckle will apply to all couplers that will be a great step in advance; but we will have to provide also for a top lift and a bottom lift no doubt, because there are certain conditions that require it.

Mr. Wildin's motion was then carried.

M. K. Barnum (Ill. Cent.): I would like to offer a motion—perhaps it could have been put as an amendment of the other motion—that the committee be authorized to incur such expense for the employment of a mechanical engineer or other assistance as seems to them justifiable and that the Master Car Builders' Association stand the expense.

The motion was carried.

Mr. Gaines: While we have talked generally, there has not been anything definite done about one point. If we get an increased head of the coupler that will give us 2 in. additional end clearance, it will save a lot of money, and I think it will be satisfactory to the majority of the roads. Therefore, I move that couplers with 11¼-in. dimensions be submitted to letter ballot.

The motion was seconded.

Mr. Seley: I think it is highly important that we decide now as to the amount of that extension. It was the argument on the safety appliance hearings that any extension would add to the overhang and produce a weakening of the structure, and I doubt very much the possibility of going any further in regard to extensions than is absolutely necessary. I am of the opinion that it will take more than 2 in. to save the troubles of some people in short clearances. It would be very handy to them, no doubt, to have a coupler 5 in. or 6 in.

longer than the present coupler, but at the same time I am persuaded that we would have no argument at all on the safety question, from an engineering standpoint, by this increase. I believe that what Mr. Gaines has suggested is moderate and consistent, and that further than that we should hesitate to go.

C. P. Cleaver (Rutland): I would like to say that I am opposed to that motion. We have expressed our confidence in this committee and in its ability to design a satisfactory coupler. Now, this is commencing to tie their hands at once, and I say that we should not do it. There might be half a dozen motions of this kind and the committee would find themselves in a position where they couldn't do anything.

Mr. Brazier: I do not think the member understands Mr. Gaines' suggestion. We are talking now about a temporary appliance, not a standard one.

Mr. Wildin: Why are we so anxious about this temporary coupler? If we can get a standard coupler inside of a year, why not wait?

Mr. Gaines: There is just this one point to be considered. In the first place, I think the coupler committee ought to have some designating dimensions, and my motion was to submit this proposition to letter ballot as a new standard, and thus give the coupler committee an increased space within which to work out the strength of the coupler and the various details. Another thing. We can gradually have all our cars come under the law without any extra expense and get our equipment standard where the 2 in. dimensions will do it without any additional expense. I think probably it will be necessary to have special couplers probably on some few roads with a larger end clearance, but not as a standard.

T. H. Goodnow (L. S. & M. S.): In seconding Mr. Gaines' motion it was with the understanding that it was not to tie up the coupler committee at all to the 11¼ in. standard head. In answer to Mr. Wildin, I would say that I think it is necessary to get a temporary coupler with that length of head at the present time so that we can stencil our cars as they come off the tracks. The United States Safety Appliance standard is required, and it will be necessary before four or five years roll around to have a great many of these couplers. I do not think the action taken by the association this morning will provide within the next two years, anyway, a standard coupler. I think the 11¼ in. dimension should be considered as a temporary expedient, and as not tying up the coupler committee at all.

Mr. Deems: I very much hope that Mr. Gaines' motion will not prevail as it applies to the work of this committee in designing a coupler. I can realize that it might be very well to have it prevail for the period intervening between now and the time we get the standard coupler. Indeed, it is quite probable that the committee will use that dimension, but I do not think we should tie their hands. If this is offered as an instruction to the committee in their designing of a new coupler I certainly hope it will not prevail.

Mr. Wildin: I want to emphasize what Mr. Deems has said. I do not understand where they got their dimension or why it is said to be satisfactory. If this committee is going to design a coupler we ought to keep our hands off and let them alone. When they put in their report, why, then is the time to jump on them if you think it necessary; but do not tell them in advance what they must not do or what they should do.

Mr. Gaines: It was not my idea to tie up the hands of the committee at all. I think Mr. Deems brought out the essential point when he stated that it is going to be some time before the committee will be ready to submit a standard. Meanwhile the 11¼ in. length I think ought to go to letter ballot and be used if carried. Besides, it will be an indication to the committee, if it should be adopted as the present temporary standard, without tying up the committee to it at all.

Mr. Wildin: I have no objection to the motion, as Mr. Gaines now explains it.

C. E. Chambers (C. of N. J.): I do not understand why the figure 11¼ in. is arbitrarily taken. We have draw bars and rigging ranging up to 5 in. in length, and I fail to see the necessity of making any standard coupler which might apply to some individual road to help it out of a difficulty and put it on us.

Mr. Fuller: I agree with Mr. Chambers that it is going to get a lot of couplers on our hands unnecessarily, and half of the roads won't have an interchange. If you have got to move your draft rigging out you might as well move it out 5 in. or 6 in., and I, for one, dislike to see a change of couplers all the time. While it may be necessary for old cars to have an emergency or temporary coupler, I think it ought to be temporary and not standard in any particular. I might say that there is probably more earnest work on the part of the committee on the expense incidental to bringing this clearance to meet the requirements than any other one subject. The subject was very carefully considered relative to the effect of the overhang. It looks

nice, and I want to say to you that if you put 85 or 100 cars on, the longer you bring out the head of your coupler the weaker your structure is. I think this addition ought to be very carefully considered.

Mr. Chambers: As to a new standard coupler, I think anybody who has walked through the repair yard will realize that the present coupler has outlived its usefulness. We do want a new coupler, but let us have it a permanent one.

Mr. Trimyer. I want to second what Mr. Chambers has said. I have made a lot of measurements of what the average distance required is to meet the new Safety Appliances Law. The figures show that we require  $4\frac{1}{4}$  in. on wooden cars and  $2\frac{3}{4}$  in. on steel cars. Therefore, the  $11\frac{1}{4}$  in. proposed by Mr. Gaines would do very little good on either class of cars.

Mr. Gaines: I would like to ask Mr. Seley whether the summing up of the figures that he tabulated last year would not show that a very substantial majority of the cars that have to be changed for end clearance would be covered by an increase of 2 in.

Mr. Seley: As I recall the figures, the tabulations of all the cars reported to the committee shows that 2 in. would cover over 50 per cent. of the cars.

D. F. Crawford (Penna.): I am quite in accord with the idea of designing a standard coupler by this association, and also a number of other standard parts that are not perhaps quite as annoying, but I would like to ask just one question. Several times this morning the present coupler has been referred to as inadequate, and Mr. Chambers just spoke of walking through yards and looking at the discarded couplers. What do you know about the present coupler? We have got to use it for some time in many cars. Is the coupler complained of the coupler that is required to pull a 150,000-lbs. car? That is our present coupler. Or is it the coupler that we purchased five or six years ago with no specification? Or the one that is purchased now without specification? We will have to use this present coupler for a year or perhaps two years.

Mr. Stark: I agree with Mr. Wildin that we ought to go slow on this matter of a temporary coupler. The wooden cars that are now short of end clearance could be changed within the next five years by moving the draft attachments out, and they will fail many times before that time comes, when repairs and the corrections can be made at the time of the making of repairs. Steel cars will be with us for years to come, and it is possible for the new proposed standard coupler to be applicable to our lighter design cars. It is possible that we may avoid substituting three or four temporary couplers and that the standard coupler will apply to the cars that we intend to perpetuate.

Mr. Gaines' motion was put, and lost.

The President: What is the pleasure of the convention with respect to the committee's recommendations?

Mr. Crawford: Was the committee unanimous in those recommendations?

The President: I so understand.

Mr. Stark: I move that they be submitted to letter ballot.

The motion was carried.

Mr. Seley: As I understand it the coupler committee is charged with the duty of getting up a new standard coupler. I do not understand that anybody or any committee has been charged with doing anything in regard to a temporary coupler. Am I right or wrong about that?

The President: You are right about it.

H. E. Passmore (T. & O. C.): Has not the Interstate Commerce Commission got that matter in hand now? Haven't they made some order about it?

The President: I have not heard of any order that has been issued in that respect. I would ask Mr. Seley if he has anything to propose in this regard.

Mr. Seley: I believe the coupler committee should undertake that work, possibly by a sub-committee; but I would presume to dictate to them how they shall handle the matter. I believe the coupler committee ought to handle all coupler questions, whether those of a temporary coupler or of a permanent coupler. I would move, Mr. President, that the coupler committee be instructed to prepare a design regarding a temporary coupler and submit it to the executive committee; this report to be expedited as much as possible through circulation of information regarding the additional length, which information shall be gained by the most expeditious means. In other words, I mean that the report to the executive committee should be made as quickly as possible.

The motion was seconded.

E. W. Pratt (C. & N. W.): I would like to ask when this has reached the executive committee, what action can they take that will bring it to a close as soon as possible? Have they the authority to submit it to letter ballot before the next convention?

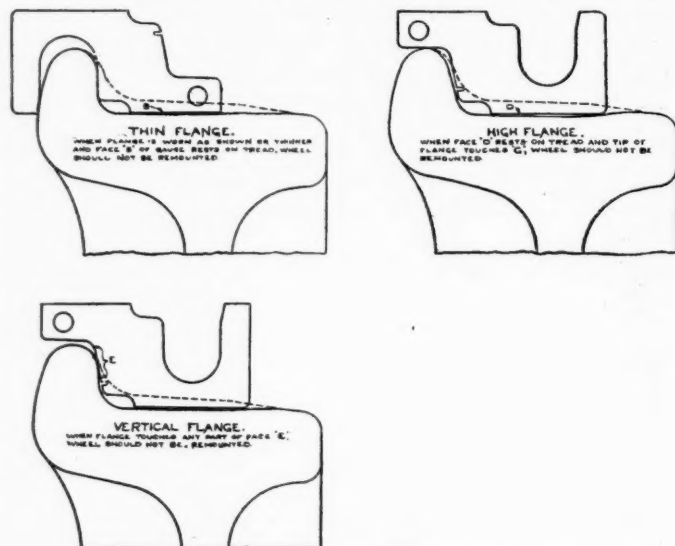
Mr. Seley: Indeed they have. They can do anything they like with it.

S. M. Hindman (Penn.): In order that the coupler committee may work intelligently to provide this temporary coupler as suggested by Mr. Fuller, there is certain information that they will have to get from the various roads. Now, they have asked in their report, in order that the number of standards may be kept to the minimum, that the members advise them of the number of cars requiring this increase. They will have to get that information before they can go ahead.

Mr. Seley's motion was put and carried.

## CAR WHEELS.

The attitude of the committee during the past year has been of a receptive nature, that is to say, awaiting developments and criticisms in regard to existing standards and recommendations made heretofore. Several modifications have been suggested in connection with the standard reference gages for mounting, inspecting and checking wheels, the circumference gage; and also, some changes in the design and use of the standard cast-iron wheels, which are herewith presented for your consideration. The committee, as heretofore, has worked jointly with the committee representing the Association of Manufacturers of Chilled Car Wheels, on subjects relating to or affecting the efficiency of the cast-iron wheels, and has added, as an appendix to this report, a com-



Instructions for Using Wheel Limit Gages.

munication received from the Manufacturers' Association, which, however, is not published herewith. The point brought out by this association is, that under present conditions with high-braking pressures the limiting factor for each weight of wheel is the temperature stresses set up on account of the rapidity with which heat is generated on the surface of tread of the wheel under heavy and continuous braking.

As the present tendency is toward increased braking pressure, it is thought possible that the present weights should be raised, particularly for wheels used under cars of high tare weight, such as refrigerator cars of 60,000 lbs. marked capacity, for which at present the standard 625-lb. wheel is used. As this question was found to be quite far-reaching in its effect upon the present standards, and sufficient time was not available to give it the thorough investigation that it demands, the committee does not feel justified in making a recommendation at this time. It is considered of such importance, however, that your attention is called to same here in order that a study be made of the subject.

The following is a copy of a circular of questions sent out by the secretary to the members of this association bearing on the diameters of steel and steel-tired wheels in connection with coupler heights, efficiency of brakes, etc.:

"1. What is the maximum diameter, steel or steel-tired wheels, that can be applied to freight cars of the class to which you might consider the application of such wheels and still keep the draw-bar height not to exceed  $34\frac{1}{2}$  in.?

"2. What is the maximum diameter of steel or steel-tired wheel that can be applied to cars, as above, and in connection with existing brake beams and heads?



"3. What is the minimum diameter of steel or steel-tired wheels that can be used in cars as above and keep the draw-bar height at all times not less than  $31\frac{1}{2}$  in. above the rail, and also keep all parts of the truck at least  $2\frac{1}{2}$  in. above the top of rail, as specified in the M. C. B. rules of interchange, bearing in mind the compression of springs, wear of brasses, journals, etc.?"

"4. What is the minimum diameter of steel and steel-tired wheel that can be used in connection with your existing brakes and not reduce their efficiency on account of the angularity of brake hangers and levers?"

"(a) With the brakes applied, what will be the angle of the brake-beam hanger with a line drawn from the center of the wheel to the center of the brake shoe, with wheel worn to minimum diameter and brake shoe worn to limit?"

"(b) What will this angle be with maximum diameter of wheel and new brake shoe?"

"5. With the maximum and minimum diameter of wheels as quoted by you, how do you propose to keep within the prescribed draw-bar height and maintain proper clearance of not less than  $2\frac{1}{2}$  in. for all parts of truck above the rail? Please explain in detail for each of the various types of truck."

To the above circular twenty-nine replies were received. After a careful analysis of them, it was found that the maximum diameter of steel or steel-tired wheels that can be used by most of the railroads and keep a draw-bar height not to exceed  $34\frac{1}{2}$  in. and be used in connection with the existing brake beams and head was 33 in., several of the roads reported that they could use  $33\frac{1}{2}$  in., and in a few instances 34 in. and  $34\frac{1}{2}$  in. In deciding upon the minimum diameter to which all-steel or steel-tired wheels should be worn, the question of maintaining a draw-bar height of not less than  $31\frac{1}{2}$  in.—making allowances for compression of springs, wear of journal and brasses, and also to compensate for the wear of the wheels—was duly considered. Three methods were suggested that can be used, depending upon the construction of the trucks, as follows:

1. Lining under center plate and side bearings.
2. Blocking under spring seat.
3. Lining on top of journal box.

The first-mentioned method can only be used to a limited extent where detachable center plates and side bearings are used. The second method can be adopted in cases where the clearance between the top of the bolster and truck frame is sufficient to allow for wear of journals and bearings and for necessary reduction in the diameter of the wheels. On trucks with steel side frames, this can not be done in many instances, and attention is called to this in order that greater clearance between the top of bolster and the truck frame be allowed in new construction. The third method can be used on most trucks except such as have the boxes cast solid with the frames, and consists in using two or three thicknesses of metal liners applied between the tie bars and the bottom of the journal box, when using maximum diameter of wheel. These liners to be transferred one by one to the top of the box as the diameter of the wheel decreases. With either of these methods it is possible in many cases to use a minimum wheel diameter of 30 in. The majority of the roads, however, advise that the minimum diameter that can be used under present equipment is 32 in.

From the replies that were received to the circular of inquiry, the following table was compiled, showing the number of railroads, the number of 40 and 50 ton cars operated by same, and the minimum diameter to which all-steel or steel-tired wheels could be worn on these roads:

9 roads representing 115,611, 40 & 50 ton cars, recommend 32 -in. wheels
3 roads representing 42,582, 40 & 50 ton cars, recommend $31\frac{1}{2}$ -in. wheels
1 road representing 12,186, 40 & 50 ton cars, recommends $31\frac{1}{4}$ -in. wheels
2 roads representing 49,117, 40 & 50 ton cars, recommend 31 -in. wheels
1 road representing 101, 40 & 50 ton cars, recommends $30\frac{1}{2}$ -in. wheels
2 roads representing 120,619, 40 & 50 ton cars, recommend 30 -in. wheels
1 road representing 1,492, 40 & 50 ton cars, recommends $29\frac{3}{4}$ -in. wheels
1 road representing 24,531, 40 & 50 ton cars, recommends $29\frac{1}{2}$ -in. wheels

From these results the committee does not feel disposed to recommend a specific dimension as a minimum diameter at which all-steel or steel-tired wheels should be worn before replacement. On account of the great variation in diameters due to wear that might be possible with the use of all-steel and steel-tired wheels, and the effect that this wear will have on the efficiency of the brakes due to the increased angularity of the brake hangers and levers, the committee has forwarded to the committee on train brakes all data bearing on this subject for its consideration.

## RECOMMENDATIONS.

1. At present, three standard gages are shown on Sheet 16, standard practice, M. C. B. Proceedings, 1910, one for mounting, one for inspecting and one for checking wheels. As these gages are all slightly different, they are confusing to the shopmen, and it has been proposed that one gage be used in place of the three gages now shown. This method has been found to be entirely practical, and is, in fact, followed by many roads. The present wheel-check gage, shown on Sheet 16, M. C. B. standard, fulfills the requirements of such a gage, and it is recommended that an illustration of same be substituted for the three gages now shown on Sheet 16, of the M. C. B. standard practice. In order to better protect the gage from wear, the gaging point at the throat of the wheel has been increased from  $\frac{1}{8}$  in. to  $\frac{1}{4}$  in. This has the further advantage of more nearly approximating the original location in remounting secondhand wheels.

It is also recommended that the first sentence, paragraph 3, under Mounting Wheels in Recommended Practice, be changed as follows:

"Third.—That in mounting wheels, new or secondhand, the 'standard wheel-mounting and check gage' be used in the following manner:"

2. In 1909 the Railway Club of Pittsburgh made the following suggestion:

"The dimension 4 ft.  $5\frac{3}{32}$  in. on Fig. 6-A be changed to 4 ft.  $5\frac{5}{32}$  in., due to not mounting more than one wheel with maximum flange thickness on the same axle. In accordance with rule 66."

This was approved by the arbitration committee in 1909 and changes made in the code of rules. The gages shown on sheet 16, however, were not changed. The dimension referred to is the distance between backs of flanges at the base line. After careful consideration, the committee does not feel that this dimension should have been increased to 4 ft.  $5\frac{5}{32}$  in., as it will not accomplish the purpose for which this change was intended, or to prohibit the mounting of two maximum flanges on the same axle. It is, therefore, recommended that this dimension should be 4 ft.  $5\frac{3}{32}$  in., as recommended in 1907 report. This will necessitate changing the dimension 4 ft.  $5\frac{5}{32}$  in. on Fig. 9, page 37, code of rules, and Fig. 9, page 599 of the Proceedings of 1910, back to 4 ft.  $5\frac{3}{32}$  in.

3. The second paragraph of rule 24 in code of rules reads:

"In no case may two new wheels having maximum thick flanges be mounted on the same axle."

It is recommended that the wording of this rule be changed to the following:

"In no case should two new wheels be mounted on the same axle when the thickness of the two flanges together will exceed the thickness of one normal and one maximum flange, or  $2\frac{17}{32}$  in."

4. The committee recommends that the standard wheel circumference gage be changed as shown in the Master Mechanics committee report on contour of tires.

5. The present method of graduating the circumference measure does not provide a definite boundary for each tape size as the tape sizes are indicated with lines. It is, therefore, recommended that instead of defining a tape size with a line, it be defined by the spaces.

6. The committee recommends that the limit gage for remounting secondhand cast-iron wheels, which is shown on Sheet 16-A of the proceedings of 1910, of the M. C. B. Association, be shown in the different positions in which it is to be used with explanatory notes as shown in Fig. 1 herewith.

7. It is recommended that the minimum flange thickness gage for new wheels, shown on Sheet 16, of the 1910 Proceedings of the M. C. B. Association, have the figure  $1\frac{5}{32}$  in. changed to  $1\frac{11}{64}$  in., in order that the minimum thickness of flange be as much below, as the maximum thickness of flange is above, a normal flange.

8. The Association of Manufacturers of Chilled Car Wheels suggested a few unimportant changes be made in the design of the present standard wheels, in order to improve foundry practice and reduce losses, which are recommended by the committee.

9. Manufacturers' Association also suggests some additional changes in the 675-lb. wheel, consisting in the reduction of the thickness of bracket and thickness of tread and making the contour of the plate same as 725-lb. pattern. The committee feels that it can not approve this suggestion until a more thorough investigation has been made.

10. It is also recommended that the part of the paragraph No. 8, page 763, of the Proceedings of 1910, which reads as follows:

"And the day, month and year when made, plainly formed on the inside plate in casting."

Be changed to read:

And the month, day and year when made, plainly formed on the inside plate in casting.

11. It is recommended that the diameter for all new steel and steel-tired wheels for freight cars be made 33 in.

12. For high-capacity freight cars built in the future and likely to be equipped with steel wheels, it is recommended that provisions be made in the construction of car and trucks to permit the use of wheels varying in diameter from 33 in. to 30 in.

This report is signed by:—Wm. Garstang, (C. C. C. & St. L.), chairman; A. E. Manchester (C. M. & St. P.), O. C. Cromwell (B. & O.), W. C. A. Henry (Penn.) R. W. Burnett (C. P.), J. A. Pilcher (N. & W.) and R. L. Ettenger (Southern).

#### DISCUSSION ON CAR WHEELS.

F. H. Stark (Pitts. Coal Co.): I move that the report be accepted and submitted to letter ballot.

E. W. Pratt (C. & N. W.): I would like Mr. Garstang to give us a little information relative to the eleventh recommendation. It occurs to me that many roads have been using a wheel somewhat larger when they buy a steel or steel-tired wheel, feeling that they will compromise between the new and old life of the wheel by having dimensions above and below 33 in. I would like to know why the committee have set 33 in. as the maximum instead of splitting the difference.

Mr. Garstang: One of the principal reasons for the 33 in. diameter was due to the fact that all wheels under freight cars at the present time are 33 in. in diameter and that the 33 in. wheel fits into the trucks and the brakes and the connections better than any other dimension.

M. K. Barnum (Ill. Cent.): As a matter of fact, quite a number of manufacturers of all steel wheels are making a standard wheel 33½ in., and the company with which I am connected has been ordering that sized wheel for locomotive tenders and also for some of its passenger cars. So long as that only raises the center of the wheel ¼ in., it seems to me that a maximum of 33 in. should be very carefully considered.

C. A. Schroyer (C. N. & W.): While we recommend that on a steel tired wheel, I think it would be a mistake to have a steel tired wheel that had to receive several turnings before it was worn out with 33 in. as its original diameter. We calculate on turning at least 1½ in. out of that metal, and then we have got 30 in. as the outside diameter of the wheel when worn out, which, as this report indicates, affects the truck leverages and the angularity of the hanger, and the speed at which the wheel revolves. I think it would be a mistake to limit the wheel to 33 in., 33½-in. or 34 in., it should be for us, because we would take them as large as we could get them, so long as the wheel did not interfere with the construction of the truck and the angularity of the brake hanger.

C. E. Chambers (C. of N. J.): I think an allowance in many different sizes of wheels should be made. In a few years it will be like it is with the coupler proposition now, and then what are you going to do if you have a 33½-in. wheel and another road's car comes along that won't take anything over a 33-in. wheel. I have heard more complaints about getting clearances down at 33½ in. and 34 in. for new cars than anything else, and I think if you use a larger wheel you are going to run up against trouble.

Mr. Garstang: I was just talking to our mechanical engineer who worked up the details of this report, and he tells me that 90 per cent. of the wheel reports received recommended a 33-in. wheel. I am heartily in accord with the gentleman who has just spoken that we do not want to get two or three sizes of wheels, and if 33 in. is not right let us make it 34 in., but get some dimension and stick to it.

Mr. Barnum: I fully agree with that, but the steel tired wheel is a different proposition than a cast steel wheel and a steel wheel with a hardened surface. As a matter of fact, I do not think there are any wheels made now that would turn down to 30 in., and my idea would be to make 33 in. the nominal diameter; start with 33½ in. and turn it down to 33 in. I believe also that the rolled steel wheels are only expected to stand about two turnings. So you will never get 30 in.

W. E. Denham (C. & N. W.): I believe that what Mr. Pratt and Mr. Barnum have stated are right in line with our best locomotive practice. I do not think anybody has had any trouble in maintaining the proper height of the draw bar on the tender with a steel tired wheel.

Mr. Pratt: Inasmuch as we have steel-tired wheels that are worn, if there should be a car that was too high we

could probably make arrangements to put in a wheel that had been turned down.

Mr. Garstang: The first question that was raised in the circular sent to our committee concerned the maximum temperature of steel-tired wheels that could be applied to freight locomotives and still keep the drawbar head not to exceed 34½ in. The answer to that question was that 90 per cent. of the replies received by the committee were in favor of the 33 in. wheel, and it was largely upon those replies that the committee made its report.

The President: The question before the house is on the adoption of the report of the committee and referring to letter ballot the recommendation made in it.

The motion was carried.

Mr. Fuller: I move that a committee be appointed, or else that the wheel committee be instructed to consider the fastenings for built-up wheels. We all know that we have wheels running the fastenings of which are not suitable for mountain service, and I think we ought to adopt a standard fastening for built-up wheels.

The President: This is a matter that must be taken up by the executive committee, and I will suggest that when they make up their programme for next year's convention they allot space to it.

Mr. Garstang: In connection with Mr. Fuller's suggestion, I think the committee ought to get up a drawing showing the principal dimensions of steel and steel-tired freight wheels.

The President: That suggestion will also be referred to the executive committee, Mr. Garstang.

#### SAFETY APPLIANCES.

The committee on safety appliances has carefully considered this important subject in the limited amount of time that it has had since the issuance of the order of the Interstate Commerce Commission in the matter of United States Safety Appliance Standards, dated March 13, 1911, which is a modification of the original order issued October 13, 1910. The United States Safety Appliance Standards prescribed in the Interstate Commerce Commission's order of March 13, 1911, must be applied to all equipment built on or after July 1, 1911. As to applying the United States Safety Appliance Standards prescribed in the Interstate Commerce Commission's order of March 13, 1911, to equipment built prior to July 1, 1911, the order of the Commission prescribed the following:

"(a) Carriers are not required to change the brakes from right to left side of steel or steel-underframe cars with platform end sills, or to change the end ladders on such cars except when such appliances are renewed, at which time they must be made to comply with the standards prescribed in said order of March 13, 1911.

"(b) Carriers are granted an extension of five years from July 1, 1911, to change the location of brakes on all cars other than those designated in paragraph (a) to comply with the standards prescribed in said order.

"(c) Carriers are granted an extension of five years from July 1, 1911, to comply with the standards prescribed in said order in respect of all brake specifications contained therein, other than those designated in paragraphs (a) and (b), on cars of all classes.

"(d) Carriers are not required to make changes to secure additional end-ladder clearance on cars that have 10 or more inches end-ladder clearance, within 30 in. of side of car, until car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed in said order.

"(e) Carriers are granted an extension of five years from July 1, 1911, to change cars having less than 10 in. end-ladder clearance, within 30 in. of side of car, to comply with the standards prescribed in said order.

"(f) Carriers are granted an extension of five years from July 1, 1911, to change and apply all other appliances on freight-train cars to comply with the standards prescribed in said order, except that when a car is shopped for work amounting to practically rebuilding body of car, it must then be equipped according to the standards prescribed in said order in respect to handholds, running boards, ladders, sill steps and brake staffs: Provided, That the extension of time herein granted is not to be construed as relieving carriers from complying with the provisions of Section 4 of the Act of March 2, 1893, as amended April 1, 1896, and March 2, 1903.

"(g) Carriers are not required to change the location of handholds (except end handholds under end sills), ladders, sill steps, brake wheels and brake staffs on freight-train cars where the appliances are within 3 in. of the location, except that when



cars undergo regular repairs they must be made to comply with the standards prescribed in said order.

"(h) Carriers are granted an extension of three years from July 1, 1911, to enable passenger-train cars to comply with the standards prescribed in said order."

The committee appended the standards prescribed by the commission.

The matter of appending to this report, drawings or cuts showing the manner of application of the United States Safety Appliance Standards to passenger-train cars was considered by the committee, but owing to the various local conditions and practices to be met by the various roads of the country in applying these standards and also to the limited amount of time in which to gather the requisite information since the issuance of the final order of the Interstate Commerce Commission the committee has not prepared drawings or cuts.

The committee recommends that the Association's standards for safety appliances, Plates 19 to 19-P, be withdrawn and that the United States Safety Appliance Standards be substituted. Plates 19-A to 19-P contain cuts showing the manner of application of safety appliances to the various types of cars and these plates also contain texts pertaining specifically to the car illustrated by the respective plate. These texts were a great help to car inspectors and others desiring to gain information quickly, and it is recommended by the committee that plates with texts of the United States Safety Appliance Standards to cover the various types of cars be submitted at the next convention.

The committee recommends that designating marks for cars equipped with the United States Safety Appliance Standards be adopted. The Interstate Commerce Commission's order prescribes that all cars built on or after July 1, 1911, shall be equipped with the United States Safety Appliance Standards, whereas there are various exceptions in the case of equipment built prior to July 1, 1911, it will be necessary to have two designating marks, that a car may readily show whether it comes under the rules for equipment built on or after July 1, 1911, or under the rules for equipment built prior to July 1, 1911.

The committee recommends the following designating mark for cars built on or after July 1, 1911:

UNITED STATES  
SAFETY-APPLIANCE  
STANDARDS, BUILT

and for cars built prior to July 1, 1911—

UNITED STATES  
SAFETY-APPLIANCE

(Date built not to be included in the marking.)

These markings to be used on each side of the car; letters if stenciled to be not less than 1 in. in height and as per the M. C. B. Recommended Practice for lettering for freight cars, sheet M; letters if on a metal badge plate to be not less than 1/2 in. in height and raised not less than 1/16 in. and have not less than 1/8 in. bar or staff. The arrangement of the words should be as near as possible as shown above.

A metal badge plate 4 in. x 12 in., with the proper margin, is preferred; one plate to be secured on each side of the car by four bolts or rivets if on metal cars, and by four bolts or screws if on wooden cars; the bolts, rivets or screws to be not less than 1/4 in. diameter. The badge plate to be made of malleable iron.

The marking for cars built after July 1, 1911, shows the word "standard," and this word "standard" designates that the safety appliances on the car comply with the law in every respect, and furthermore, this same marking should be applied to any car that is equipped with safety appliances that complies with the law in every detail, regardless of the date the car was built.

The word "standard" is omitted in the marking of the cars built prior to July 1, 1911, and having safety appliances which are permissible (not standard) for service by complying with the order of the Interstate Commerce Commission, which permits a variation on cars built prior to July 1, 1911, that is not permitted on cars built after that date.

The report is signed by:—Theo. H. Curtis (L. & N.), chairman; C. B. Young (C. B. & Q.), Henry Bartlett (B. & O.), T. M. Ramsdell (C. & O.), M. K. Barnum (I. C.), W. O. Thompson (N. Y. C. & H. R.) and A. LaMar (Penna.).

#### DISCUSSION ON SAFETY APPLIANCES.

E. W. Pratt (C. & N. W.): I do not quite understand this lettering. It seems to me that the only difference in stenciling is in relation to the word "standard." We are very likely to have our painters stencil that word on the cars which should not have it on, as well as those which should. I do not see what the idea is of putting any such stenciling as that at all on cars not standard. Perhaps the committee had some reason in mind.

C. A. Seley (C. R. I. & P.): The stenciling on the vast majority of present cars changed over will have the stenciling as indicated by the committee, without the word "standard." That word "standard" will only be applied to new cars, which you will buy in the near future, and I should doubt the advisability of giving the painter a stencil with the word "standard" on it until the road had arranged to have complete standard cars. It is going to be some little time, I think, before that can be arranged by any road. Of course, any new car which is to be repaired will have the stencil in accordance with the new standard. It will require a little effort and care, as Mr. Pratt suggests, but I do not think we will have quite the amount of trouble which he has in mind.

J. F. De Voy (C. M. & St. P.): I did not get your meaning with relation to the metal badge plate. Do you mean that will do away with the stenciling of the date on the side of the car? We do not understand why it should be that way. Is that a ruling?

Mr. Curtis: Yes.

Mr. De Voy: Would it be optional to do it as we are doing it now?

Mr. Curtis: It will be optional; you may use whichever method you choose. You will find it hard to find room enough on some of the flat cars to put the stenciling on the cars, and the badge plate can be used with much greater ease and comfort to the man putting it on.

Mr. De Voy: And, of course, with a great deal more comfort from the commercial end of it. Some one will do some business we might do in our own shops.

C. A. Schroyer (C. & N. W.): What is the object of putting this badge plate on, or even stenciling it? Does not the condition of the car imply whether it is standard or not?

Mr. Seley: I might answer Mr. Schroyer, while I am on my feet, and say that it was understood with the inspectors who attended the conference committee that we would mark our cars so that they could be designated as United States standard. It is not required by law, but we had that practical understanding that we would do it. I did not know the malleable plate had been so named until hearing the remarks of Mr. Curtis in presenting the report of the committee. I think that should be changed to cast plate, and you could use either a gray iron casting or a malleable iron casting as you saw fit.

F. H. Clark (B. & O.): Inasmuch as the committee recognize the fact that on a good many of our cars we have not much room for additional lettering or stenciling, and as the committee has already abbreviated United States to U. S., why not abbreviate Safety Appliances also in the same way, making it read U. S. S. A.?

Mr. Curtis: I was a member of the conference committee, and as a matter of good faith with the inspectors I feel that they expect we should use the words "Safety Appliances."

Mr. Schroyer: If there is a badge plate that goes on that car with the initials indicating what it means, it is just as good as spelling out the whole word. We are doing that on many of our cars, putting the initials of the road on the car, instead of spelling out the whole word, and I am in favor of using the initials.

C. D. Young (C., B. & Q.): I believe there will be a good deal of confusion between the two types of stencils for the cars which have been built prior to and those which were built after the passage of the law, and it has occurred to me that it might be desirable for future cars, those coming up to the requirements of the law, to have a seal of some form in a small stencil or casting, and leave the other abbreviations or spelling out of the words, for the old cars brought up to the requirements so far as it is necessary. I think it is very desirable to reduce the amount of lettering all we possibly can. As everybody knows it costs us more now to letter our cars than it does to print them, and we are putting more lettering on, and it simply increases the expense every time you put more letters on your car, but if a seal could be worked out for the future cars that would designate the thing that we require, that this car has been built in accordance with the standard prescribed by law, it would soon become known to anyone whenever that seal appeared on the car that the car was in accordance with the requirements, and it would also give you the difference between the old cars which had been brought up to the standard and the new cars which had been built in accordance with the requirements.

G. W. Wildin (N. Y., N. H. & H.): I do not like this designation—the old car that is brought up to the standard is just as standard as a new car built to standard.

Mr. Crawford: If it is brought up to standard, yes.

Mr. Wildin: You have two standards, one for old cars and one for new cars, which fill the laws as a new one does. If

you get the 10-in. clearance, you have the standard for old equipment. It looks to me as if there should be a plainer designation.

Mr. Schroyer: I think Mr. Wildin is correct in that respect. The old car, when equipped in compliance with the law as modified, has everything that is required under the law, and there should not be anything on the car to indicate a difference between an old car and a new one.

C. E. Fuller (O. P.): I ask Mr. Schroyer how his inspector is going to determine between a car built after July first and the car that has left your shop with these modifications. In one case he is justified in accepting the car without a penalty, while in the other case he is not justified in accepting it, and he cannot take the time to measure the cars to see if they conform to the requirements. He has to know something definite about it. He has five years to bring these cars up. It is the inspector I am looking out for.

Mr. Schroyer: I regret to have the inspector brought in it at all. If we are to expect to educate the inspectors to know all about the safety appliances, starting from the sides and ends of the cars, we must get a different class of inspectors. If we instruct our inspectors that on and after a certain date cars must not be accepted unless they comply with the law, there will be a good deal of confusion. This should not be done for our own inspectors, but for the accommodation of the inspectors of the Interstate Commerce Commission. I think that is the object that we ought to keep in mind.

Mr. Wildin: I think our own inspectors will have to know something about it until all cars are completed. It seems to me the committee did wrong in leaving out the date. It seems to me that the date when the car was built should be applied on all cars. If you say "U. S. Safety Appliances" and put the date on the car, the car people will know in each case which car complies with the law, and nobody can go would have all the information. He would not have all the information desired.

B. F. Crawford (Penn.): Mr. Wildin stated the inspector would have all the information. He would not have all the information unless he made measurements. He would not know whether the car must maintain to the standard or the standard as modified by the order of the commission. There are many cars running their lives out with grab irons and appliances not fully in accordance with the standards, but they will be accepted under the order. They will vary as much as 3 in. from the standard, which is perfectly permissible. It was the intention of the committee, as I understand it, to mark these cars which will run for many years with variations from the standard U. S. Safety Appliances. Those which conform strictly to the standards, and which we expect other roads to maintain for us and which we expect to maintain for other roads at the standard, will be marked "U. S. Safety Appliances, Standard." There is a clear line of demarcation between the two, which I think can be supported legally.

J. F. Deems (N. Y. C.): I confess I don't grasp the necessity for these two markings. The instructions which have gone out on the New York Central lines are to the effect that no car shall be marked "U. S. Safety Appliances" unless it is absolutely standard in every way. I think that is the correct interpretation. As to these cars that are changed the 3 in., to which Mr. Crawford referred, we know that car will be allowed to be passed in interchange, and will not be penalized, but it is not marked, and if one of the inspectors of the government singles that car out and objects to it, we can defend ourselves under the law, and I do not believe the car should be marked. I believe it is misleading. I do not think any car should be marked except a car that conforms absolutely to the rules laid down for a new car. Many of our old cars that are made to conform to the modifications will pass in interchange without difficulty. If we take advantage of the latitude given us under the modifications that are secured, that car is not marked, but goes through all right. I think it is a mistake to mark it and it will result in a great deal of confusion. Perhaps I am wrong about it but we discussed it fully and decided, while many of the cars would run and pass and we would not be penalized for them, they would not be marked because they did not conform absolutely to the standards. If a car is made to conform absolutely, it does not make any difference whether it is old or new.

M. K. Barnum (Ill. Cent.): Our road had a conference of everyone interested in the safety appliance question, and we took exactly the position Mr. Deems has outlined, and have only marked cars, whether new or old, that are standard in every detail.

R. L. Kleine (Penn.): The marking of the cars, not strictly in accordance with the United States Standard Safety Appliance

Laws, which do not conform to the requirements of the government, is for the purpose of helping out the car repairmen and inspectors. When that car goes to the shop and the safety appliances, after the five year period are within 3 in. of certain dimensions, that car can go out of the shop, otherwise the car would have to be changed to the U. S. Safety Appliances. For that reason the markings should prevail on the cars.

Mr. Seely: I think the position of the committee is entirely consistent for the very reason Mr. Kleine states, that at the expiration of the five year period, what are you going to do, how are you going to know—are you going over each car and measure it to find if you can safely accept it? If the car is stenciled by some method or other, then when the inspector sees the car after the expiration of a five year period he will know whether the car complies with the law or not, without going into the measurement of these safety appliances as to whether it is acceptable or not. It is the easiest way out of the trouble, I believe, in order to comply with the legal requirements, that we should follow the recommendation of the committee, and that all cars fully and completely equipped in accordance with the standard shall show the word "standard," and those which comply with the modifications shall show "United States Safety Appliances." I think I can say safely that it will be a breach of faith with the inspectors unless we do this very thing.

Mr. Schroyer: I want to make a motion, that instead of using the words "United States," that the initials "U. S." be used.

Mr. Curtis: That is optional in the report. As chairman of the committee I will take it upon myself to change the words "malleable iron" to "metal"—the badge plate shall be made of metal, so that you can make it of brass, malleable iron or cast iron.

Mr. Clark: I move that the words "Safety Appliances" be abbreviated to "S. A."

Mr. Crawford: I would like to ask if the wording of this is in agreement with the U. S. Safety Appliance inspectors or merely the result of our own conference committee?

Mr. Schroyer: I believe there would be no objection whatever on the part of the safety appliance men to having that abbreviation.

Mr. Curtis: These words "United States Safety Appliance, Standard," are taken from the law. It is not required by the law. It was in a nice way requested by the inspectors of the Interstate Commerce Commission that we would use this designation. In good faith the conference committee took the matter under consideration, and I feel it safe in saying it was implied by us and understood by the inspectors that a marking of this order would be placed on the cars.

Mr. Clark: If it is understood that "U. S. S. A." means United States Safety Appliances, is not that a practical compliance with the request of the inspectors, and could not we go even further while we are at it, and put the letter "S" on the cars, and have it understood that the letter "S" means these things? Why should we put a lot of white paint on our cars where it is not necessary?

Mr. Curtis: We have the privilege of doing what we please in this matter.

C. D. Young (C. B. & Q.): I would like to amend the motion to have the committee submit a drawing showing the metal plate, or a stencil plate, which would give the marking for the cars built strictly in accordance with the standard, and preferably to have some designating character such as the combining of the four letters, or one single letter in a circle of some character, so that anyone looking at that seal or stamp will understand exactly what is meant by it.

Mr. Schroyer: I second the amendment.

The President: Do you accept the amendment, Mr. Clark?

Mr. Clark: I do not understand the purpose of the amendment.

Mr. Schroyer: It means the adoption of a uniform branding.

Mr. Clark: I am in favor of that, want to see it simple. We want to cut out a lot of the lettering. We have too much now. We can make some abbreviations so that it will help out in that respect. My suggestion was simply to make it U. S. S. A.—that means just as much as to spell it out. We can go even further than that, as Mr. Young suggested, and put the letter "S" in a circle, or something of that sort. That, I think, will cover the ideas of the inspectors, although I have not talked with them about it. This is simply an agreement, and the agreement is to have some sort of marking added on the cars, to show that the car complies with the standards. We do not need a lot of lettering in order to make that clear.

T. L. Trimyer (S. A. L.): I would say that we have received a drawing from the association showing this stencil,



and are actually receiving cars now with the stencil on them. I notice a good many roads are repairing cars, making them conform to the requirements, and a good many of them are in service and are stenciled. It occurs to me it is quite late now to make a change. It has been specified on a large lot of new equipment, and is actually being applied in service.

S. M. Hindman (Penn.): At the meeting of the committee yesterday, I believe the question of making a drawing, as suggested by Mr. Young, was brought up.

Mr. Curtis: The time was not sufficient. Mr. Lamar tried to make a drawing, but he had no tools.

Mr. Hindman: It seems to me very important that this association should officially take up the work done by the conference committee and support any agreement or understanding that that committee had with the Interstate Commerce inspectors, and I think it would be very inconsistent for the association to adopt anything that did not follow these lines; but, of course, it would be left to the roads to adopt them if they saw fit. It seems to me that we ought to carry out the letter and the spirit of the agreement in that conference as far as possible, and then, if it is thought best to reduce the lettering, have another conference with that object in view.

Mr. Crawford: I move that the report of the committee be adopted.

The President: There are two pending motions before the house—a motion made by Mr. Clark and an amendment by Mr. Young. The amendment by Mr. Young will be put first, and that was the committee submit a drawing showing the metal plate or a stencil plate which would give the markings for the cars, and that it was preferable to have some designating character, such as the combining of the four letters or one single letter in a circle. (The amendment was defeated.)

The President: We will now put to vote the motion made by Mr. Clark, that the words "U. S. Safety Appliances" be abbreviated to "U. S. S. A."

(This motion was defeated.)

Mr. Crawford's motion was put to vote and adopted.

#### REVISION OF CODE OF TESTS.

The committee appointed to revise the M. C. B. specifications for testing apparatus and code of test for freight triple valves in connection with 100-car trains begs to submit the following proposed revision and respectfully requests its discharge:

##### CONDITION OF TESTS.

Triple valves will be tested on a rack representing the piping of a one-hundred (100) car train. All cocks, angles and connections will be as nearly as possible identical with those in train service. The rack shall conform to blue-print C-11379 (Rev. 3-9-09) in the hands of the committee, which gives the proper fittings, piping, cylinders, auxiliary reservoirs, main reservoirs, automatic brake valves, etc.

The main reservoir capacity shall be approximately 57,000 cu. in. The capacity of each auxiliary reservoir shall be such as will, with a pressure of 70 lbs., produce 50 lbs. pressure in its brake cylinder when fully equalized in service application with 8 in. piston travel.

The air supply for the test rack shall be obtained from a locomotive type of air compressor having a capacity of from 80 to 120 cu. ft. of free air per minute. The compressor to be controlled by a single top-pump governor adjusted to maintain 110 lbs. main reservoir pressure.

Tests will be made with a brake-pipe pressure of 70 lbs., except when otherwise specified.

With brake-pipe and auxiliary reservoirs charged to 70 lbs., the section of branch pipe between the cut-out cocks and triple valves, also the triple valves, should be tested with soap suds and leakage eliminated. Branch pipe cut-out cocks should then be closed and brake valve placed in lap position; break-pipe leakage should then not exceed 2 lbs. per minute.

Brake-cylinder packing leathers must be maintained in good condition and free from leakage.

All tests shall be made with 8 in. piston travel, except when otherwise specified.

Triples must be so constructed that they can be secured and operated on apparatus conforming to Diagram D-15611 (which shows triple valve end of auxiliary reservoir, branch-pipe union and location of bosses for retaining valve pipe, with detail dimensions of each as well as detail dimensions between these parts when in the relative position they would occupy if triple valve were in place).

The auxiliary reservoirs, brake pipe and brake cylinder of

the first, twenty-fifth, fiftieth, seventy-fifth and one hundredth brakes shall be fitted with test gages. All gages must be calibrated and maintained in good condition. Brake No. 1 shall be fitted with two recording pressure gages, one to be connected to the brake-pipe branch pipe, the other to the brake cylinder, and brake No. 100 shall be fitted with a test gage connected to the brake cylinder. The attachment of electric circuit closers, also the general arrangement of the electric circuit wiring, shall be as shown in Fig. 1.

Tests shall be repeated three times under the same general condition, a record being taken of each test, also the average result of each three tests. The room temperature at the time of the tests shall be recorded, also humidity.

The essentials of a quick-action trip'e valve are, charging, service application, graduation, release and quick action.

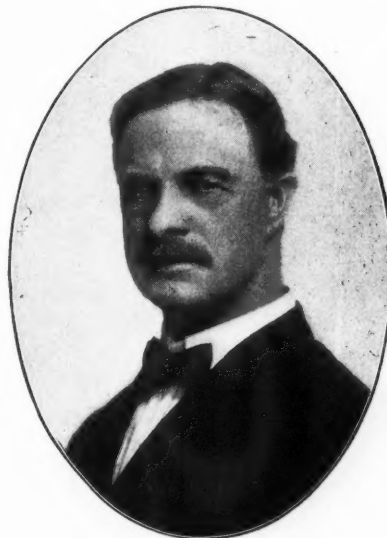
##### INDIVIDUAL TRIPLE-VALVE TESTS.

##### Charging Tests.

Not less than three triples, selected at random, shall be tested, as follows:

With the triple valve cut out at the branch pipe cut-out cock; the auxiliary reservoir empty; and 90-lb. brake-pipe pressure maintained, the triple valve should be cut in.

A. Under these conditions the auxiliary reservoir should be charged from zero to 70 lbs. in not more than 90 seconds nor less than 70 seconds.



A. J. Cota.

Chairman, Committee on Revision of Code of Tests.

B. When triple is in normal release position, the auxiliary reservoir should be charged from zero to 70 lbs. in not more than 60 seconds and not less than 40 seconds.

##### Service Application Tests.

A.—(To determine sensitiveness to service application.)

1. Three valves, selected at random, shall be taken for this test and each tried separately. They will be tested on the first brake of the rack using the brake pipe only of the first car and locomotive, having the engine and tender brakes cut out.

2. These triple valves should apply in service when the brake-pipe pressure is reduced by direct discharge to the atmosphere through an orifice which will reduce brake-pipe pressure from 70 to 60 lbs., in 16 to 18 seconds, with brake valve and triple valves on locomotive and first brake cut out.

3. In preparing for this test, insert the required disk in union shown in Fig. 2 with all cocks closed, after which open cock C and start test by opening cock B.

B.—(Graduating Test.)

1. Three valves, selected at random, shall be taken for this test and each tried separately. They will be tested on the first brake of the rack, using the brake pipe only of the first car and locomotive having the engine and tender brakes cut out.

2. The first admission to the cylinder should be made with a reduction of brake-pipe pressure not exceeding 5 lbs.; each succeeding reduction should reduce the pressure in the auxiliary reservoir not to exceed 3 lbs., until equalization takes place. The pressure in the brake pipe should not be

more than 3 lbs. lower than the equalized pressure in the brake cylinder and reservoir at equalization.

**C.—(Holding Test.)**

Three valves selected at random will be taken for this test and each tried separately on the first brake on the rack, using the brake pipe only of the locomotive and the first car, having the triple valves cut out on engine and tender. The one brake will be applied, admitting as nearly as may be 15 lbs. into the brake cylinder following a service application. Record of pressures in the auxiliary reservoir cylinder and brake pipe will be taken as follows:

First. At completion of application.

Second. In five minutes.

Third. In ten minutes.

Fourth. In fifteen minutes.

In this test, when a constant brake-pipe pressure is maintained, the brake-cylinder pressure must not be increased more than 5 lbs. in 5 minutes.

**D.—(Release Test.)**

Three triple valves, selected at random shall be taken for this test and each tried separately. They will be tried on the first brake of the rack, using the brake pipe only of the first car and locomotive having the engine and tender brakes cut out. When the triple goes to normal release position it must exhaust the air from the brake cylinder from 50 to zero pounds in not more than 15 seconds.

When the triple goes to retarded release position it must

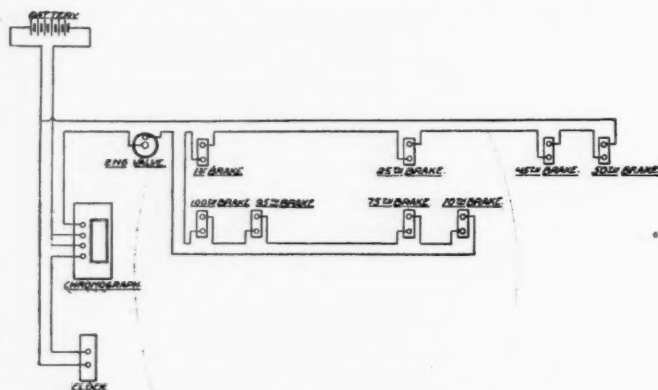


Fig. 1—Wiring Plan M. C. B. Brake Rack; Purdue University.

exhaust the air from the brake cylinder from 50 to zero pounds in not more than 40 seconds.

**Emergency Application Tests.**

(To determine sensitiveness to quick action.)

Three triple valves, selected at random, shall be taken for this test and tried separately on the first brake of the rack. During this test the locomotive and tender triples are to be cut out.

**A.**—These triple valves must give a quick-action application when the brake-pipe pressure is reduced by direct discharge to the atmosphere through disk with a  $\frac{1}{16}$  in. orifice.

**B.**—These triple valves must not give a quick-action application when the brake-pipe pressure is reduced by direct discharge to the atmosphere through a disk with a  $\frac{1}{16}$  in. orifice.

**C.**—(Holding test.) Three triple valves, selected at random, shall be taken for this test and tried separately on the first brake on the rack. The brake will be applied in quick action by moving the brake-valve handle to emergency position, where it must remain until completion of test for the purpose of insuring the discharge of all brake-pipe pressure. Record of pressure in auxiliary reservoir and brake cylinder will be taken as follows:

First. At completion of application.

Second. In five minutes.

Third. In ten minutes.

Fourth. In fifteen minutes.

In this test the auxiliary reservoir and brake-cylinder pressure must not show a reduction of more than 5 lbs. in 5 minutes.

**RACK TESTS.**

**Service Application Tests.**

**A.**—(Service Equalization.)

With a service reduction of 25 lbs. from brake-pipe pressure, a brake-cylinder pressure of not less than 48 lbs., nor more than 52 lbs., must be obtained.

**B.**—(Graduating Test.)

1. A reduction of 5 lbs. in brake-pipe pressure should

apply lightly the 100 brakes. However, the brake-cylinder pressure may not be sufficient to show on all test gages.

2. A further reduction of 4 lbs. to 6 lbs. should increase the cylinder pressure of all brakes.

3. A further reduction, making a total of 25 lbs., should equalize the pressure between the auxiliary reservoirs and brake cylinders.

**C.**—(Service application time.)

Brakes will be applied by reducing brake-pipe pressure 10 lbs. There shall not be more than 25 seconds difference in the time of obtaining 10 lbs. pressure in the cylinders of the first and one hundredth brakes.

**Emergency Application Tests.**

**A.**—(Quick action, time and pressure.)

The one hundredth brake must be applied with at least 45 lbs. pressure in  $\frac{6}{10}$  seconds from the movement of the brake-

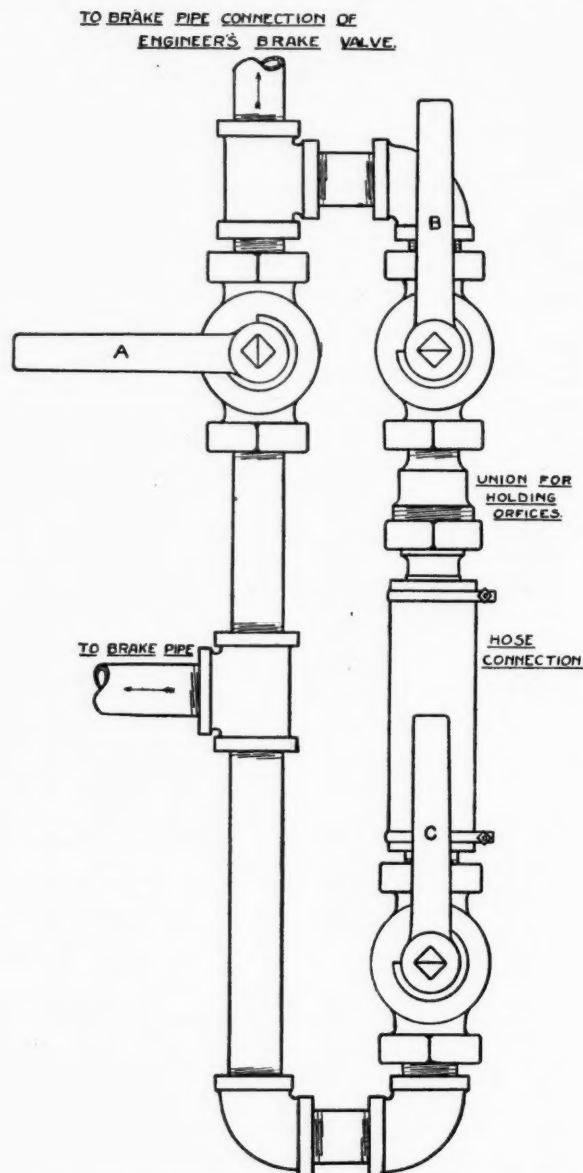


Fig. 2—Piping Arrangement for Brake Test.

valve handle to emergency position and at least 55 lbs. in 7 seconds. The final maximum pressure in this test must not be less than 15 per cent. nor more than 20 per cent. above the pressure given by the same brake in full service application. This test will also be made to determine that quick action is obtained with:

First.—Four inches piston travel.

Second.—Twelve inches piston travel.

(Note.—The object of this test is to secure, as nearly as possible, uniformity of pressures in brake cylinders in an emergency application and uniformity of time required to obtain the pressures; to secure a minimum length of stop and a minimum of shock, and of trains parting.)



B.—(To determine whether quick action will follow a service application.)

Using the 100 brakes, make a service reduction such as will give 20 lbs. cylinder pressure on the first brake. Then place the brake-valve handle in emergency position, which should cause quick action operation of all triple valves. The pressure in the first cylinder will be increased or decreased by steps of about 5 lbs. until the point at which quick action commences or ceases is determined.

C.—(Quick-action jumping test.)

With brakes Nos. 1, 2 and 3 cut out, quick action should be obtained with the remainder of the brakes by an emergency reduction, and the time, from the movement of the brake-valve handle to emergency position to obtain 45 and 55 lbs. cylinder pressure on the one hundredth brake, should not be increased more than one second over that required to obtain the same pressures with all brakes cut in. This test should be repeated with groups of three brakes cut out, consisting of Nos. 2-3-4, 4-5-6 and 5-6-7, and the time from the movement of the brake-valve handle to emergency position to obtain 45 and 55 lbs. cylinder pressure in the one hundredth brake should be the same as with all brakes cut in. These tests will also be made with piston travel of 4 in.

#### Holding Tests.

A.—(Following a service application.)

The one hundred brakes will be applied, admitting, as nearly as may be, 15 lbs. into the cylinder of the first brake. Record of pressures in the auxiliary reservoirs and cylinders will be taken at all record points as follows:

First. At completion of application.

Second. In five minutes.

Third. In ten minutes.

Fourth. In fifteen minutes.

In this test any increase of brake-cylinder pressure should be in proportion to the reduction in brake-pipe pressure due to leakage.

B.—(Following a quick-action application.)

The 100 brakes will be applied in quick action by placing the brake-valve handle in emergency position, where it will be left until completion of test, for the purpose of insuring the discharge of all brake-pipe pressure. Record of pressures in auxiliary reservoirs and cylinders will be taken at all record points as follows:

First. At completion of application.

Second. In five minutes.

Third. In ten minutes.

Fourth. In fifteen minutes.

The results of this test must not indicate an excessive amount of back leakage into brake pipe.

#### Release Tests.

A.—(Release Time.)

The 100 brakes shall be applied with an 18 lb. service reduction of brake-pipe pressure and brake valve then placed in release position. Time will be taken from the movement of the brake valve into release position until pressure is reduced to 5 lbs. in the cylinder of the first brake. The pressure in the cylinder of the first brake should not reduce to 5 lbs. in less than 18 seconds nor more than 25 seconds.

(NOTE.—Main reservoir pressure must be 110 lbs. at time of release.)

The report is signed by:—A. J. Cota (C. B. & Q.), chairman; J. R. Alexander (Penn.), and F. H. Scheffer (N. C. & St. L.).

The report was presented by J. R. Alexander in the absence of A. J. Cota, Chairman.

C. E. Fuller (U. P.): Before going on to the discussion of this subject, I would like to go back to the report on safety appliances. We have a standard safety appliance code in the M. C. B. Association, and, to be consistent with the work that we have done this morning, I would move that the report of the committee on safety appliances be referred to letter ballot, including the requirements of the U. S. Safety Appliances which are to be adopted as the standard of this association, the same to be referred to letter ballot.

R. L. Kleine (Penn.): That brings up the other question that was left over to the committee on standards with regard to the safety appliances. That would eliminate questions Nos. 11, 24, 25, 53 and 55, and still leaves open the following to be acted on: 12, hand brake for freight cars to work with air. The suggestion on that was to refer the matter to the committee on hand brake and signal equipment. Nos. 48 and 49, hand brakes on passenger cars to be worked with air, and that also was to be referred to the committee on train brake and signal equipment. And 60, to advance the

7/16-in. brake chain to be standard, to be referred to letter ballot.

D. F. Crawford (Penn.): I move that the two points referred to by Mr. Kleine which should be referred to the committee on train brake and signal equipment be so referred, and that the third question be referred to the Association for letter ballot.

The motion was carried.

#### DISCUSSION OF CODE OF TESTS FOR AIR BRAKES.

E. W. Pratt (C. & N. W.): I know the amount of work that was required of this committee in getting up this report as I was fortunately a member of the committee for several years; hence, I wish to criticize the report very reluctantly. But I notice under *Service Application Tests*, section A, numeral 2, the reduction in the brake pipe travel is shown by the number of pounds reduced in a given time. This, to my mind, is a very great improvement over what has been the practice heretofore, namely, giving the size of orifice through which the air must escape. But in other parts of this report, under *Emergency Application Tests*, it gives the size of the orifice that we should use in order to produce quick action. It seems to me it would be well for the committee to make that a given reduction in a given time, the same as the one I have just referred to. To be sure, it states here that there is nothing but the locomotive pipe and the car pipe cut in. However, the size of locomotives have been changed within the past year or two from 50 ft. to 150 ft., and it does make a great deal of difference as to the length of the engine whether the size of the orifice will give the same time reduction in one case as in another. There is another thing that the committee should explain to us, and that is the style of brake valve, if a brake valve is to be used in making these tests, that is, to be standard for this testing apparatus; and also it would be more than interesting for us to know what triple valves are best employed for the purposes of this test.

J. W. Alexander (Penn.): In reply to Mr. Pratt, I wish to say that the opening is given for the emergency test. It would be extremely difficult to determine that by time limit, for the reason that the movement of air is almost instantaneous through an opening of that character, and it is a question of getting the orifice down to a size in which a quick, sudden movement of the air will affect the triple valve at a certain distance from it, and these tests were made on. In regard to the type of brake valve, the Figs. 1 and 2 show the attachment, but you can put any type of brake valve—Westinghouse or New York or any other type—on the test, and this also shows the kind of triple valves that have been subjected to these tests and possibly these tests may be said to be practically all of those in general use on the different roads of the country.

The report was accepted and recommendations submitted to letter ballot.

#### REFRIGERATOR CARS.

The committee was instructed to investigate and report on three separate questions, as follows:

The uniform height of refrigerator cars from the rail to the floor.

Adoption of standard drip cup for refrigerators.

Relatively small ice tanks.

THE UNIFORM HEIGHT OF REFRIGERATOR CARS FROM THE RAIL TO THE FLOOR.

The investigation of this subject shows that a large majority of the refrigerators built within the last ten years or more have the height of floor varying between 48 in. and 50 in. above the rail, but the Santa Fe Refrigerator Dispatch has some 6,000 cars with floors approximately 46½ in. above the rail. We have not been able to learn of any cars which have the floor at 42 in. above the rail, as stated in the Railroad Refrigerator Service Association Circular 84, dated June 26, 1909.

It is also found that all freight-house platforms of the largest roads and packing-houses vary in height from 42 in. to 46 in. above the rail, and understand that the American Railway Engineering Association has not yet adopted any standard height for freight-house platforms; we therefore suggest that the Master Car Builders' Association adopt a minimum of 48 in. as the recommended practice for refrigerator-car floors, and that the matter be taken up with the American Railway Engineering Association with the view of having them adopt 46 in. as the maximum height of freight-house platforms, as we believe that this will make ample allowance between the bottom of refrigerator doors

and top of platforms, so as to avoid trouble about opening the doors at freight houses.

#### STANDARD DRIP CUP FOR REFRIGERATORS.

In Circular 73 the Railroad Refrigerator Service Association specifies the following requirements for an ideal drip cup:

It must keep the lower end of drain pipe submerged in water when tanks contain ice during summer or winter.

It must prevent water in drip cup from freezing in winter when cars are iced without salt.

It must prevent cold air from entering car in winter when cars are not iced.

The committee has not yet been able to find any drip cup which will meet all of these requirements, which now seem impossible to meet in full, but the committee will continue to investigate the subject and make supplementary report.

#### RELATIVELY SMALL ICE TANKS.

Refrigerator cars may be divided into two general classes:—Fresh-meat cars; and fruit and dairy cars.

The best and most modern refrigerators are used for shipping fresh meats, and these are provided with ice tanks which experience has proven to be amply large. Fresh-meat cars use crushed ice and salt, and a total capacity of



M. K. Barnum.

*Chairman, Committee on Refrigerator Cars.*

5,000 lbs. per car has been found ample for all ordinary service conditions; the committee, therefore, recommends that tanks of 5,000 lbs. ice capacity be adopted as the minimum for such cars.

For fruit and dairy refrigerators a minimum of 3,000 lbs. per tank, or 6,000 lbs. per car, is recommended. Our investigation leads us to believe that the complaints mentioned by the Railroad Refrigerator Service Association have been caused by old cars that had ice tanks much smaller than the present practice, which are rapidly disappearing from service, and we believe tanks of the size above recommended are amply large to protect shipments under all ordinary conditions.

The traffic department will be the first to object to encroaching any further than necessary on the loading space of the car, and there seems to be no present necessity for increasing the outside length of the car beyond about 40 ft., the present size of the largest refrigerator.

The report is signed by:—M. K. Barnum (I. C.), chairman; J. S. Chambers (A. C. L.), G. W. Lillie (St. L. & S. F.), W. E. Sharp (Armour Car Lines), E. Posson (A. T. & S. F.), W. C. Arp (Vandalia) and R. S. Miller (N. Y. C. & St. L.).

#### DISCUSSION ON REFRIGERATOR CARS.

Mr. Barnum (chairman of committee): In regard to the freight house platforms, it is stated that the committee intended to take up with the American Railway and Maintenance of Way Association the matter of having them adopt 46 in. as the maximum height of freight house platforms. Since the report was written we believe that should be made 44 in., and we wish to correct the report to read 44 in.

I have the supplemental report here, reading as follows:

The committee has continued its investigation of a standard drip cup for refrigerator cars, and has obtained from a number of the roads which are the largest owners of refrigerators and also from the packing companies drawings of their standard drain cups, together with reports on their performance. All of these drain cups are alike in their essential features, consisting in:

1. A depression or cup below the level of the drip pan into which the water drains; and

2. A drain pipe, the top of which projects above the bottom of the cup to a varying height, thereby retaining some water in the cup round about the pipe, which, with the inverted cap fitted over the top of the drain pipe, forms a water seal. This arrangement permits the melted ice to overflow into the drain pipe and at the same time prevents the admission of warm air in summer; but it will not obviate freezing in winter, and the drain pipe must be plugged to exclude cold air in freezing weather. All of the replies received to our inquiries indicate that there are no serious complaints about the last two features. Our investigation leads us to believe that the combination of requirements specified by the Railroad Refrigerator Service Association are mechanically impossible.

I might give a little further explanation of our reason for changing the maximum height of platform from 46 in. to 44 in. We found that the average refrigerator car door has a bevel of about 2 in., which would make the outside edge of the door about 2 in. below the floor of the car; and there are quite a good many refrigerator doors that have locks which project a little below the outside edge of the door, and we thought that it was advisable to increase the minimum distance between the car floor and the top of the platform to 4 in., which we believe will be ample for all practical purposes.

J. J. Hennessey (C. M. & P. S.): It does not seem to me that the report of the committee has covered the point that a great many roads are much interested in, and that is the matter of salt water drippings.

Mr. Barnum: We disposed of that last year.

Mr. Hennessey: The committee disposed of it in a certain sense last year, but at the same time I do not see that the private lines are making much of an effort to get any device that will carry the salt water drippings clear of the tracks. I think it is well understood that especially the Maintenance of Way people are very much exercised at so much salt water drippings on metal bridges, tie plates, etc., and I believe this is a question which should be gone into very thoroughly and a greater effort made than has already been made to ascertain if some device cannot be worked up which can be adopted as a standard to prevent salt water drippings from refrigerator cars.

Mr. Barnum: I will recall to the mind of Mr. Hennessey and that of the other members of the association the fact of last year the committee on refrigerator cars recommended that certain principles be followed for the purpose of retaining within the icing tanks the salt water drippings and discharging them at the icing stations. We considered that that covered the subject, and the committee was discharged as having completed its work in that particular. It then remained to take up with the companies owning refrigerator cars and using salted ice the matter of carrying out the instructions. I have made some inquiries as to how the work is progressing and I find that the packing houses, particularly the owners of refrigerator cars using salted ice, have tried several devices in the form of valves for the purpose of retaining the salted water and discharging it at icing stations, and I find that they have been successful in retaining the water, but have had some trouble with the valves freezing, thus making it difficult to open them at the icing stations. I was informed by the representatives of several packing houses in Chicago that they were fitting up all cars as they passed through their shops with such valves, and I think so far as the committee of this association is concerned we have done all that we can in that direction, and if anything further is to be done it will have to be taken up by the American Railway Association with the private car owners who handle the refrigerator cars. Perhaps Mr. Sharp can give some additional information on this matter which will be of interest.

W. E. Sharp (Armour Car Lines): The supplemental report of Mr. Barnum covers that point. We have tested several valves, and much to our surprise we have had difficulty in operating them; not in holding the brine, but the valve must be placed at the lowest point on the tank in order to drain the entire tank, and, as that is the coldest place in the tank, the valve freezes. A remark was made that not much effort was



apparently being made by the owners of refrigerator cars to overcome the annoyance from the dripping of salt water. We have not said anything about it, but we have been busy and there is no intention on our part to go to sleep on the subject. We have a number of cars equipped with valves of different types. We are not operating them, because it would be a serious matter to undertake to operate a valve until you know it is reliable and that you can draw the water off at the icing stations.

We invite the committee and the individual members of the association to cooperate with us on this matter and to come to our shops and see what we are doing. I feel free to say that the other packers, as well as the company that I represent, are going to continue their efforts and accomplish just what you want us to accomplish, and that by another year there will be a decided improvement in that direction.

A. Stewart (Southern): I move that the recommendations of the committee be referred to letter ballot.

The motion was carried.

#### THE ANNUAL MASTER CAR BUILDERS' BALL.

The forty-fifth annual ball of the Master Car Builders' Association was given on the Million Dollar Pier last night at 9.30 o'clock. The officers of the association and their ladies were personally conducted from the hotels to the pier in roller chairs by members of the Marshals' Committee. At the entrance to the pier, they were met by members of the Social Squad, and escorted to the booth of the Galena-Signal Oil Company at the ocean end of the ball room, which was headquarters for them during the evening. As President and Mrs. Curtis crossed the floor the band played "Hail to the Chief."

There were 376 couples in the grand march. It formed at the ocean end of the pier and was conducted by Chairman J. Will Johnson of the Entertainment Committee and led by President and Mrs. Curtis. It performed numerous graceful evolutions, during which the Ushers' Committee presented the ladies with favors. They were fancy gauze fans.

There were 19 numbers on the regular dancing program; and in addition, the Vollmer's Orchestra, which furnished the music, responded to a number of encores. Refreshments were served at both the ocean and Boardwalk ends of the ball room throughout the evening.

All the members of the Entertainment Committee were on duty. The committee especially in charge of the ball was composed of Thomas Farmer, Jr., Chairman; W. J. Walsh, F. B. Ernst, C. A. Dunkelberg, Ralph C. Coburn, H. A. Nealley, J. P. Landreth, Edward S. Toothe, J. C. Younglove, Leonard J. Hibbard, William Miller, Harry S. Hammond and E. E. Silk.

The following briefly describes the way in which the ladies of some of the railway officers were gowned:

Mrs. T. H. Curtis, shell pink satin, veiled in Chantilly lace and white chiffon, with rhinestone trimmings; carried orchids.

Mrs. C. E. Fuller, white Chantilly robe over pale yellow satin.

Mrs. J. F. Deems, Par's gown of King's blue, with jet overdress; pearls and diamonds.

Mrs. G. W. Wildin, lingerie over pink satin.

Mrs. F. W. Brazier, lavender and silk chiffon, with inside lining of green silk and black jet trimmings; carried pink roses.

Miss Verona Pratt, blue flowered net over blue satin, trimmed with marabout.

Mrs. Wm. Garstang, white lace over satin.

Miss Mabel Garstang, yellow lace heavily embroidered over yellow satin; carried orchids.

Miss Virginia Garstang, American beauty colored chiffon over white satin; carried lilies of the valley.

Mrs. R. D. Smith, net gown embroidered in pink and white and trimmed with fillet lace over white satin; carried sweet peas and orchids.

Mrs. J. S. Chambers, violet crepe meteor embroidered; carried orchids.

Miss Hazel Cumbach, pink marquisette; carried pink roses.

Mrs. B. P. Flory, black marquisette over yellow satin; carried American Beauty roses.

Mrs. H. E. Passmore, white batiste with lace trimming.

Mrs. George T. Anderson, black satin with lace trimmings; carried American Beauty roses.

Mrs. J. F. Dunn, white lace dress over white satin; carried orchids.

Miss Edna Dunn, white crystal over pink satin; carried orchids.

Miss Helen MacBain, blue chiffon; carried roses.

Miss Grace MacBain, white chiffon; carried lilies of the valley.

Miss Mary D. Walsh, pink mulle with pink ribbon; carried orchids.

Mrs. E. W. Pratt, pale green crepe de chine with raised velvet flowers, rice bead trimmings and point lace.

Mrs. Jas. A. Beamer, white Swiss with white embroidered trimmings.

Miss Blanche Beamer, pink Swiss with point lace.

Mrs. R. B. Kendig, gray voile over pink, touches of green with fillet lace; carried orchids and lilies of the valley.

Mrs. W. E. Sharp, white voile with hand-embroidered lace; carried orchids and lilies of the valley.

Mrs. C. B. Young, white voile.

Mrs. H. F. Wardwell, soft yellow silk, trimmed with pearls.

Mrs. R. L. Klein, black lace gown over apricot satin.

Miss Margaret Hennessey, pink and bordered chiffon; American Beauty roses.

Mrs. Thomas T. Thompson, white satin, veiled in violet chiffon and lace; carried orchids.

Mrs. T. M. Ramsdell, embroidered net over cream messaline.

Mrs. I. A. McCormick, white lace with heavy French embroidery.

Miss Louise Ramsdell, white chiffon over yellow satin.

Mrs. F. S. Kent, apricot radium silk, coral chiffon, Venetian lace trimmed with marabout.

Miss Barbara Small, fancy lingerie dress over pink; carried orchids.

Mrs. H. Telford, white lace over white silk; carried pink roses.

Mrs. J. A. McRae, black lace dress with spangled trimmings; carried orchids and roses.

#### THE HERFORD MONOLOGUES.

The entertainment given yesterday afternoon at the Brighton Casino was enjoyed by everybody. Miss Beatrice Herford, society entertainer in original monologues, was at intervals handicapped by a competing thunder storm, but the shower soon passed. Miss Herford has a pose and delivery that is unique, and her ability in adapting herself to suit the various sketches was thoroughly entertaining. The program consisted of the following:

I. In a Restaurant.

II. An Elderly English Lady Packing Her Trunk; Her Niece Helping Her.

III. A Girl in a Telephone Pay Station.

IV. Choosing the Wall Papers.

V. The Shampoo Woman.

The entertainment committee very thoughtfully provided enclosed chairs for the audience to return to their hotels so that no inconvenience was due to the impromptu shower.

The railway from Volcan, Chili, to Maipu, which starts from Puerto Alto, the terminal point of the Pirque Railway, has been opened to traffic.

## Conventionalities.

If you see one, you see the other—the Davis Brothers.

It was the intention of J. C. Barber to attend this convention, but he was unavoidably detained.

Frank W. Noxon, secretary of the Railway Business Association, was a visitor on the Million Dollar Pier yesterday.

Hugh M. Wilson came down from New York to renew acquaintances for a few days with his host of friends at the conventions.

Ronald G. Coolbaugh, who is attending the convention for the first time as a railway supply man, is the son of F. W. Coolbaugh. Mr. Coolbaugh is a Cornell man.

M. K. Barnum, general superintendent motive power of the Illinois Central, did not get here for the M. M. convention, but is here for the M. C. B. convention.

Arthur P. Bowen, director of purchases, Pullman Company, Chicago, passed Monday and Tuesday on the pier attending the conventions and seeing the exhibits.

George E. Carson, master car builder of the New York Central at West Albany, N. Y., is at the Traymore. He is said to have made a remarkably fine record during the past year.

One of the most effective workers at the convention is Mrs. I. H. Case. It is an interesting sight to see her take visitors in hand and show them over the model house of Dearborn.

Staff says he didn't say that the presidency of the Railway Supply Manufacturers' Association was unexpected. What he did say was, that he had not sought the office—which is absolutely true.

J. H. Manning, superintendent motive power of the Delaware & Hudson, is extremely enthusiastic over the service results which are being obtained from the big Mallets which are being used on that road.

R. B. Kendig, general mechanical engineer of the New York Central Lines, had quite a severe illness during the spring. He is in attendance at the conventions, however, and seems to have fully regained his health.

H. C. Manchester, formerly superintendent motive power of the Maine Central, is missed by his friends this year. Since the last convention he has been appointed superintendent of transportation, and is busy now getting out the summer schedules.

W. L. Jacoby, whose energy resulted in building a large steel plant in which the first tire was rolled within 14 months after ground was broken, is staying at the Brighton. Mr. Jacoby started to make tires 20 years ago, when he was but 17 years old.

Hugh Montgomery, superintendent motive power of the Bangor & Aroostook, is stopping at the Dennis. He has been very busy during the past year. About 150 miles of new road were opened recently and 200 miles more will probably be built in the near future.

A. M. Darlow, who was appointed mechanical engineer of the Buffalo & Susquehanna a few weeks ago, is at the Marlborough-Blenheim. He came down early last week and has been working hard to put in his time to the best advantage, both in the meetings and in studying the exhibits.

John H. Jaschka, of the National Malleable Castings Company, who recently changed his headquarters from Salt Lake City to San Francisco, is again on the job. Mr. Jaschka says it is a long way to come, but he feels that it is a great pleasure to meet his many friends here.

Henry Bartlett, general superintendent mechanical department of the Boston & Maine, is at the Brighton. The new Pacific type locomotives, the first to be introduced on that road, are handling the heavy Portland passenger trains, and trains on the White Mountain division, with splendid results.

As the Cadets de Gascogne, who furnished the music for the M. C. B. reception, speak only French and Italian, and Chairman Johnson, of the entertainment committee, speaks only the rest of the languages, the conversations between them had the soul of wit: they were plenty brief.

G. W. Kelly, master blacksmith at the Elizabethport shops of the Central Railroad of New Jersey, who presided over the last convention of the Master Blacksmiths' Association, arrived Monday afternoon and returned home last night. He worked hard all the time he was here in studying the exhibits.

George Carr, of the Dearborn Drug & Chemical Works, saved the Million Dollar Pier yesterday morning by heroically extinguishing a bad fire in a waste basket. It will be recalled that his brother Bob was a candidate for a Carnegie medal a couple of years ago when he rescued a young lady in the surf.

F. H. Stark, superintendent of the Montour Railroad and of the Pittsburgh & Moon Run and superintendent rolling stock of the Pittsburgh Coal Company, arrived early Monday morning and is stopping at Chalfonte. Business has been a little light, but he is looking forward to a big rush during the midsummer months.

Yea, verily, advertising in *The Daily* pays. After A. L. Whipple's new folding umbrella had been lost for four days, *The Daily* was informed of the fact and at once printed a notice that "Whip" was mourning the loss. The same day that the notice appeared the lost umbrella was returned to the owner—and "Whip" is happy once again.

We have not as yet been able to decide which is the biggest exhibit here, but we do know the littlest exhibit; and the aforesaid littlest exhibit is attracting great attention. Little Miss Lillian Brazier is attending the conventions. She was born to Mr. and Mrs. F. O. Brazier seven months ago, on the birthday of her grandfather, F. W. Brazier.

J. F. Walsh, general superintendent motive power of the Chesapeake & Ohio, is looking forward with a great deal of interest to the testing out in service of the two 4-8-2, or Mountain, type locomotives which are about to be placed in operation on his road. These engines are intended for use in fast passenger service on the mountain grades.

Lou Yates, master car builder of the Pacific Fruit Express, lives in Los Angeles and goes bathing in the Pacific. He comes to Atlantic City to the conventions and goes bathing in the Atlantic. He likes the Atlantic and says it is a bit warmer than that of the Pacific. As for the climate, he says that of the Pacific coast has a decided "shade" on that of the Atlantic.

A pleasant automobile trip from Buffalo to Atlantic City was enjoyed last week by Mr. and Mrs. George N. Dow, Mr. and Mrs. Harry Schroyer and Mr. and Mrs. Harry U. Morton, in Mr. Schroyer's Pierce-Arrow. The trip was made in four days, the party arriving on Tuesday. Mr. and Mrs. Schroyer will motor from Atlantic City to Chicago, their home city, leaving Wednesday.

The members of the Enrollment Committee have presented to Oscar F. Ostby, chairman of that committee, a handsome silver mounted snake-wood cane, engraved with Mr. Ostby's initials. With the gift was sent a letter expressing the esteem and good-will which Mr. Ostby's able and diplomatic management has inspired in all who have come in contact with him at the conventions.



It was rumored among the convention crowds yesterday that J. E. O'Brien, superintendent motive power of the Western Pacific, had been appointed general superintendent motive power of the Missouri Pacific. A telegram from President B. F. Bush of the latter road to *The Daily* says: "There is nothing in the report of O'Brien coming to the Missouri Pacific as general superintendent motive power."

The following has been received from dear old David Holtz, who still feels as young as he did 20 years ago: "Just a line to let you know where my thoughts are this week. I had engaged a room, but on account of being on the grand jury and not able to get excused, I gave it up and forfeited the pleasure I had had in mind of meeting you again and my other friends in the Master Mechanics' and Master Car Builders' associations. I hope for better results next year. I am receiving the daily edition of the *Railway Age Gazette*, and my daughters and I have enjoyed reading the names of those attending the convention, and the reports."

The last meeting of the Entertainment Committee was held yesterday noon. At the conclusion of the meeting, C. A. Dunkelberg, in behalf of the members of the committee, expressed to J. Will Johnson, the retiring chairman, the feeling of gratification and good will held by every member toward their leader, and presented him with a handsome open-face gold watch. Mr. Johnson responded feelingly. Everybody who has attended the conventions the two years of Mr. Johnson's chairmanship will concur in the statement that this mark of recognition for the work he has done is heartily merited.

C. A. Schroyer, superintendent car department of the Chicago & North Western, loves to put one over in the shape of a real good joke that does no harm. His many friends know this only too well; they can testify to having been stung, but not hurt, on occasions too numerous to mention. But the "worm will turn," as we all know; and it is therefore with great glee that Charlie Schroyer's friends are repeating the story of a sail on the ocean indulged in last Sunday by a party of which Mr. Schroyer was a member. When at some distance from the Inlet the wind failed and in a short time the calm became complete. It was then that Mr. Schroyer addressed the commander of the yacht, and in this fashion: "I say, captain, while there is nothing doing in the way of wind, would you loan us a line I'll show you how to land a few fish for dinner." The captain said he was very sorry but that there were no lines aboard. Then he winked to the members of the party and handed this to the Chicagoan: "However, Mr. Schroyer, rather than disappoint you, I have this suggestion to make. I will give you a pencil and paper and you can drop a line to the fish." Just then the breeze sprang up; but in the general merriment, in which Mr. Schroyer heartily joined, its arrival was not noticed.

#### M. C. B. REGISTRATION.

Alexander, J. R., Gen. Rd. Fore., Penna. R. R., Haddon Hall.  
Bundy, C. L., G. F., D. L. & W. R. R., Haddon Hall.  
Deibert, John H., F. C. R., Lehigh Valley R. R., Boswell.  
Dow, Geo., Gen. Mech. Ins., N. Y. Cen. Lines, Chalfonte.  
Grove, P. L., A. E. M. P., Penna. R. R. Co., Chalfonte.  
Halverson, H., M. C. B., Soo Lines, Seaside.  
Harris, Wells, G. F. C. R., N. Y. N. H. & H. R. R., Chester Inn.  
Henderson, Geo. R.  
Jaynes, R. T., M. M., Lehigh & Hudson, Traymore.  
Kells, Willard, Asst. to G. S. M. P., A. C. Line, Revere.  
Kipp, A., G. C. I., N. Y. O. & W. Ry., Chalfonte.  
Lindstrom, C. A., Chief Engr., Pitts., Allegheny & McKees Rocks Ry., Chalfonte.  
McBain, D. R., S. M. P., L. S. & M. S., Marlborough-Blenheim.  
McGraw, Wm. P., Supt. of Cars, Jamison Coal & Coke Co., Dennis.

Morris, W. S., Special Agt., C. & O., Marlborough-Blenheim.  
Ott, Wm. B., Asst. Engr. M. P., Penna. R. R., Chalfonte.  
Sheahan, J. F., M. M., International & Grt. Northern, Arlington.  
Turner, Amos, M. M., Lehigh Valley R. R. Co., Dennis.  
White, E. T., S. M. P., Mt. Clare Shops, B. & O. R. R., Haddon Hall.  
Wyman, R. L., M. M., Lehigh & New England R. R., Pennhurst.

#### M. M. REGISTRATION.

Brooks, H. S., Asst. M. M., B. & O., Colwin.  
Newhouse, John F., M. M., Kentucky & Indiana Ter. Rwy.  
Shepard, L. A., The Steel Castings Co., Dennis.

#### GUESTS.

Baird, A. N., Insp. Boiler & Plate, Santa Fe.  
Bedell, Thos., Chalfonte.  
Billan, L. S., Ch. Draftsman, B. & O. R. R., Arlington.  
Beach, C. A., Supt. N. Y. Div., Phila. & R., Dennis.  
Beswick, J. H., Foreman, P. R. R.  
Bracken, J. W., Clk. to Supt., P. R. R., Haddon Hall.  
Bradley, E. J., Foreman Car Inspect., P. B. & W. Ry.  
Brown, J. D., Ch. Electrician, B. & O. R. R.  
Carmichael, E., Gen. Foreman, P. R. R., Traymore.  
Clarke, Arthur B., For. Car Rep., P. & R.  
Cook, J. J., Road For. Eng., P. R. R.  
Cook, C. A., Master Painter, P. B. & W., Devonshire.  
Cooke, George T., Mechanical Inspector, The Pullman Co., Traymore.  
Culver, W. R., M. M., Union Tank Line, Young's.  
Dixon, A., Gen. Fman., C. P. R., Haddon Hall.  
Dykeman, William, C. C. to Pur. Agt., N. Y. C., Marlborough-Blenheim.  
Elholm, E. L., D. & H. Co., Monticello.  
Endy, W. N., Stkpr., P. & R.  
Enslow, Frank, Attorney, C. & O., St. Charles.  
Entrikin, T. C., Mach., P. & R.  
Erb, C. W., Stkpr., P. R. R., 605 Pacific Ave.  
Finney, Harold R., Asst. Road Foreman, Penna. R. R., Marlborough-Blenheim.  
Fox, P., G. F. C. R., Erie R. R., Shelburne.  
Garabrand, W. P., R. F. of E., Penn. R. R., Haddon Hall.  
Gibson, Edward, Foreman Wheel Shop, P. B. & W. Ry.  
Gearhart, H. F., Pur. Agt., Pressed Steel Car Co., Chalfonte.  
Gilliard, W. J., Shop Clk., P. R. R., Haddon Hall.  
Grim, Chas. B., For. Car Insp., P. & R. R., Dennis.  
Hankins, L. G., Ch. Clerk.  
Hardy, C. R., M. P. Insp., P. R. R., Newton.  
Heald, W. E., Supt. Const. Elec. Dept., B. & O., Traymore.  
Herr, E. D., P. R. R.  
Hinkle, H. M., Asst. Road For. Eng., Penna. R. R., Elwood.  
Hughes, S. W., G. C. For., Wash. Term. Co., Ardmore.  
Hynes, J. M., Gen. For. M. P. Dept., B. & O.  
Illig, L. J., Ch. Draftsman, Penna. R. R., Haddon Hall.  
Jackson, C. H., For. Car Insp., P. R. R.  
Keith, J. T., Vineland, N. J.  
Kerigan, W. R., Ch. Clk. Rd. For. of Eng., P. R. R., Haddon Hall.  
Kerigan, F. J., Ch. Clk. to M. W., P. R. R., Haddon Hall.  
Kiefer, C. J., Insp. Test. Dept., P. R. R., Iroquois.  
Lowther, H. F., Asst. Pur. Agt., D. L. & W., Frontenac.  
Lane, S. F., Gen. Supt., L. C. & Moriah, Shelburne.  
Lewis, Chas. W., Asst. M. S. At. Ref. Co., Union Tank Line, Young's.  
Loudback, A. L., M. C. B. Clerk, Penna. R. R., Pennhurst.  
McConnell, Saml., Marlborough-Blenheim.  
McCool, Chas., Reg. Clerk, Pur. Dept., P. R. R.  
McCormick, W. H., Asst. Gen. Pass. Agt., P. & R., Chalfonte.  
McHarg, J. J., Chief Clerk, Penna. R. R., Haddon Hall.  
McIntosh, J. B., Supt. L. H. & P., Wash. Term. Co.  
Mackey, W. C., Foreman, B. & O. R. R., Pennhurst.  
Mathus, S. R., Master Mechanic, Norfolk & Southern, Dennis.  
Miller, E. W., Car Foreman, B. & O., Tryon.  
Morgan, C. H., Dfa. Fr. Agent, P. & R., Dennis.  
Munger, E. T., Gen'l Supt., H. & M. Ry., Shelburne.  
Netopp, R., For. Car Shops, Penna. R. R., Camden.  
O'Donnell, J. C., Inspector, P. R. R.  
Oliver, R. G., M. M., P. R. Transit, Dunlop.  
Pastorius, O. B., Genl. Electrician, W. J. & Seashore, Marlborough-Blenheim.  
Pryor, C. L., S. Buffalo Ry., Marlborough-Blenheim.  
Rankin, W. E., For. Wayne Test Shop, P. & R.

Runkle, D. F., For. Car Shop, P. & R., Somerset.  
 Riffert, Harry V., P. W. Ins., P. & R.  
 Ringland, J. A., Fore. Eng. House, P. R. R., American.  
 Rue, W. M., Loco. Engineer, P. R. R.  
 Roberts, G. H., Mach. Foreman M. P., L. I. R. R., Windsor.  
 Russell, H. H., Genl. Foreman, N. Y. P. & N. R. R., Chalfonte.  
 Schanze, H. C., Fman., P. R. R.  
 Searing, J. J., 3d., Asst. Shop Clerk, Penna. R. R., Pennhurst.  
 Sickles, E. C., Supt. Pow. House, B. & O.  
 Shay, J. M., Gen. Car For., B. & O. S. W., Pembroke.  
 Simon, Louis S., Schlitz.  
 Shannon, Wm. P., Asst. Fman. Car Shops, Penna. R. R., Elwood.  
 Staples, Oscar, Eng. House Foreman, P. R. R., Haddon Hall.  
 Stewart, H. A., Shop Superintendent, Armour Car Line, Marlborough-Blenheim.  
 Stratton, G. E., Gen. Foreman, P. R. R., Haddon Hall.  
 Stroble, Harry H., Gas Fitter, P. & R.  
 Travella, W. H., Foreman, P. R. R.  
 Turk, J. E., Supt., P. & R., Dennis.  
 Van Buskirk, J. H., M. E., N. Y. Central, Chalfonte.  
 Walsh, Charles E., Asst. Ch. Clerk P. Agt., Penna. Lines R. R., Brighton.  
 Walton, E. A., Chalfonte.  
 Wells, W. W., Chief Clerk 4th V. P., P. R. R., Dennis.  
 White, Geo., Storekeeper Meadows, P. R. R., Marlborough-Blenheim.  
 Wilbur, Rollin H., Vice-Prest. & Genl. Manager, Lehigh & New England.  
 Wright, J. D., Genl. Foreman M. P. Dept., B. & O., Rudolf.  
 Wolf, G. M., Gen. Foreman M. P. Dept., B. & O.  
 Yoder, J. H., Foreman, P. & R.  
 Zimmerman, Geo., For. Car Shop, P. & R., Somerset.

#### THE TRACK EXHIBIT.

The track exhibit this year includes a motor passenger car, some special dump cars, box cars, a portable forging plant and an industrial car. The motor passenger car is the one built by the General Electric Company, and has a seating capacity for 95 passengers. The passenger section of the car is divided into two compartments, one for smokers. The engine is of the gasoline internal combustion type driving an 80-kilowatt generator with an overload capacity running up to 120 kilowatts. The motors are of the ordinary type, so that there is really nothing experimental about the design. The engine and motor are carried above the springs and form an ordinary stationary plant, while the motors are on the trucks, as in regular street car service. An auxiliary engine is provided for driving the generator for the electric lights and also for providing compressed air for the brakes when the main engine is standing.

A novelty at the exhibition is the forging car, exhibited by the United Engineering Forging Company. It is a portable forge set on a steel underframe car and fitted with an oil furnace for heating material, a steam hammer for doing the work, with a boiler for supplying the steam. Both the boiler and the furnace use oil burners, which are supplied with fuel from a tank car serving as a tender. It is possible to execute work of considerable magnitude with this plant, as demonstrated by the daily operations.

The Railway Equipment Company shows three hopper bottom cars. Two have the hopper doors swinging on a line parallel with the length of the car, and in the other the doors are hinged on the transverse line. They are closed by a chain with block links winding over a rectangular block, and drawn up by means of a long handled wrench. The locking is effected by a ratchet and pawl, the latter being held down by a gravity lock, so that there is no danger of the pawl slipping or the dog letting go under the motion of the car.

Another hopper bottom car is that equipped with the Johnson hopper door and shown by the Industrial Supply & Equipment Company. The door resembles in its action the ash-pan door used on the New York, Ontario & Western which is carried by two parallel hangers, and is so arranged as to have its first opening motion a drop away from the bottom of the hopper, after which it slides out towards the

end of the car, leaving the whole of the opening clear and unobstructed.

There is a refrigerator car shown by the Whipple Car Company in which some simple novelties are incorporated. The insulation is a four-ply felt. The ice-boxes are collapsible and can be moved in and out with ease. The outer insulated partition when pulled out is held in place by knee-joint hinges like a buggy top, as well as by the ice racks that drop down from the end of the car. Access to the interior is obtained through a door in the front. On the roof there are four waterproof ventilators that are self-draining, and are set to face the ends of the car. Their action is to force the air in at one end of the car and down into the ice box, thence out at the floor and through the car to an escape at the ventilators at the other end. The interior ventilation is provided for by a double roof extending to the line of the side door. This roof is perforated with a number of 3-in holes through which the warm air rising from the lading passes to the air space above and thence to the ice box at the ends. This avoids the necessity of the air moving from the ends to the center of the car in order to escape. It is stated that, with this construction, a temperature of 45 deg. Fahr. has been maintained throughout the whole length of the car with fruit lading from Colorado to Chicago.

Next to this is a box car fitted with the Franklin flexible roof and exhibited by the Franklin Railway Supply Company. This roof is an all-steel structure. The carlines and purlines are of pressed steel, and the roof sheets are held by clamps at the edges and an inverted T-clamp that lies in the groove of the carline. The running board saddle is carried by bolts, passing through the legs of the carlines and held clear above its edges, so that there is no possibility of the sheets of the roof being caught and consequently buckled by any warping of the body of the car. The leakage of water due to driving storms is provided for by carrying the sheets over the edge of the ridge, which is a U-shape, with the opening up. Water may be driven into this, but it drains into each carline, which, in turn, forms a trough to carry the water to the eaves, where it is discharged. The use of pressed steel straps insures strength in the roof, while the method of holding the sheets provides an equal insurance against the buckling of the roof sheets.

A drop-bottom gondola, from the Cincinnati, Hamilton & Dayton, is also shown. This has a method of rolling up the doors by means of a crankshaft, fitted with rollers, and having a ratchet and dog at one end near the bolster, by which it is operated and held in place. This car is built with deep center sills and no side sills.

The Summers all-steel box car has a truck of a peculiar construction, which has been already described in these columns.

Loaded on a flat car are two examples of the Jacobs Shupert firebox, with which the readers of this paper are already familiar. One of these fireboxes is set in proper position so that it can be seen from the outside, while the other is laid on its side so that the interior or fire-side can be seen through the opening in the mud ring. Finally, there is a small industrial motor car shown by the Atlas Car & Manufacturing Company.

The progress which is being made in the developments at the Port of Bahia, Guatamala, gives every indication of this point becoming a formidable rival of the other ports in the republic. The railway from that town to Quito is being pushed forward vigorously, and already there has been opened to traffic a section extending to a point near Calceta, a distance of 33 miles. The preliminary survey on the Chone branch, via Caimito, has been completed, as has also the survey on the line from Guayaquil to Balzar. Plans for the installation of an electric light plant are now being prepared, and every effort is being exerted to render the port of Bahia de Caraquez an important commercial center.



**MAINTENANCE OF SUPERHEATER LOCOMOTIVES.**

The superheater locomotive does not require any more attention to obtain satisfactory service than an ordinary locomotive. It is essential with a fire-tube superheater that the flues be kept open, and free from accumulations of cinders and dust, which would prevent the attainment of the desired degree of superheat. A double loss occurs when the flow of gases through the flue is restricted, for the reason that the flue itself and the superheater surface of the tubes are reduced in efficiency. To keep the large flues clean it has been found that the first requisite is regularly in blowing them out. If they are blown out at regular and frequent intervals, less time is required to prepare the engine for the road, as the cinders have not had time to become baked hard. If the flues are blown out on every round trip, this operation is not much of a task. An air pressure of about 100 lbs. per sq. in. is generally used for this purpose. A  $\frac{3}{8}$  in. pipe long enough to reach all the way through the flue is inserted from the fire-box and below the superheater tubes, and is gradually worked forward, blowing the cinders and dust out of the flue into the smoke box. It frequently has been found that carelessness in cleaning the flues results in the cinders being blown part way, where they are not visible from the fire-box, and the engine is reported as having clean flues. This condition merely invites a more rapid accumulation of cinders, followed by an immediate reduction in the efficiency of the superheater.

Frequent inspection of the front end should be made; this is easily accomplished by means of hand holes on each side of the boiler, a short distance ahead of the front tube sheet, from which any leakages of the superheater tube joints or of the tubes in the front tube sheet can be readily ascertained. Any leakages of air into the front end are, of course, just as detrimental to a superheater engine as any other.

On a large number of lines it is customary to give a thorough inspection and test of the superheater at regular periods. The test is made with water pressure. To make it the steam chest valve ports are blocked and the dome cap removed; the steam pipe headers and superheater tubes are then filled with water, which is introduced through a special water test fitting, generally located on the left hand steam pipe, to which a hose may be connected by taking down the netting manhole. After the water level reaches the throttle, this is securely blocked up and the pressure is raised to the desired amount. In this way the joints of all parts carrying steam between the throttle and steam chest are tested for leakages with a minimum amount of labor.

The troubles which in some cases have been experienced in keeping the large flues tight in the fire-box tube-sheet have been eliminated by the improved methods of setting and working, with the result that flue troubles are practically a thing of the past. When it is found necessary to repair the flues in the fire-box tube-sheet a prosser is now generally used in preference to a roller. This prosser tool should be made with not less than 12 sections to give satisfactory results, and except in very bad water districts a very light prossering is all that is necessary. When a roller is used it should have not less than five rolls, as the use of tools with a smaller number of rolls has proved injurious for this size of work. Plugs driven into the tubes and flues surrounding the one which is being worked has in many instances proved good practice.

The superheater damper and its cylinder should be maintained in operating condition. The object of the damper is to prevent the flow of gases through the flues at a time when live steam is not passing through the superheater tubes. If the damper is not in operative condition it causes damage to the part of the superheater tubes closest to the fire-box; while this condition does not produce any immediate bad effects it does cause a deterioration of the superheater tubes and return bends in the course of time, which the damper is designed to prevent. It is not possible to tell just how fast this deterioration is,

but when the means are provided for preventing it, it is important that it should be kept in operating condition and not be rendered useless by the lack of a little attention.

When the engine is being fired up this damper is in a closed position. When the flues are being blown out, however, it should be open, so that all cinders and dirt removed from the flues may drop out of the damper into the smoke box, where they can easily be taken out.

When extended piston rods and guides are provided for engines using highly superheated steam, they should be given careful attention and inspection. The tendency has been, when extended piston rods were used, not to give them the proper adjustment or attention. A number of greatly improved designs have been brought out in which the early troubles have been eliminated, and several of these are in very satisfactory service at the present time. A carefully maintained piston rod guide of good design will prove an invaluable aid in the satisfactory operation of superheater engines. Experience has shown that the cost of maintenance has not increased over the saturated steam engine, nor is the time which they are out of service for attention greater than it is for the non-superheater engine.

**FOREIGN RAILWAY NOTES.**

The Russian Council of Ministers has considered the general question of Siberian railways and favors the construction of the Semipalatinsk-Barnaul-Novo-Nikolaieffsk Railway at the expense of the treasury. At the present time in view of the applications made from the interested towns the council approves the construction of the Altaisk railways on a concessionary basis with the object of having them completed as soon as possible. This line is likewise of great economic importance to the region it will traverse.

In Queensland, the northeastern colony of Australia, where for some years there has been very little railway building, while the country was recovering from the three-years' drought, the government now purposes to construct a line along the coast from Rockhampton northwestward, 634 miles, through Mackay and Townsville to Cairns—all coast towns; and another nearly parallel with it, but about 350 to 400 miles further west from Charleville, the terminus of a railway from Brisbane, northwestward through Longreach and Winton and Cloncurry to the western border of the province at Camooweel, 1,282 miles. This latter would serve as part of a great transcontinental line to the northwest coast of Australia, and would make an enormous grazing country accessible.

A bill was introduced in the congress of the republic of Chile during the January session for the establishment of a special savings bank and pension system for employees of the state railways. This measure, which has been approved by the senate, provides for the raising of funds for the savings bank in the following manner: 5 per cent. of the earnings of employees; fines levied on employees for the improper performance of their duties; receipts from advertisements in railway stations; unclaimed wages of employees, and 0.0015 per cent. of the receipts of the state railways. The bank is to be managed by an administrator and board of directors composed of five members, two of whom shall be the director general of railways and the administrator of the second section of the central railway system. Pensions will be granted to persons who have served the state railways 10 years or over, and who have become incapacitated for service. Employees completely disabled because of injuries sustained during the performance of duties in the employ of the state railways are entitled to a pension for life at full salary, and employees temporarily incapacitated are entitled to full salary during their convalescence for a period not exceeding six months.

## The Exhibit.

A passenger brake beam with the adjustable head feature for four or six-wheel equipment is one of the many interesting things to be seen in the Buffalo Brake Beam Company's exhibit.

The tea rooms on the boardwalk do not compare with the artistically arranged reception booth of the Galena-Signal Oil Company, Franklin, Pa., where luncheons are served to the ladies.

The Heywood Bros. & Wakefield Company, Wakefield, Mass., was unable to get a suitable space this year, and for that reason it is not making an exhibition of car seats. Bertram Berry is here in the company's interest, as usual.

Charles W. Gutzzeit, general manager of the Titan Steel Castings Company, Newark, N. J., arrived Sunday night. Mr. Gutzzeit was appointed general manager of this company January 1. He was formerly with the Taylor Iron & Steel Company.

The full-size working model of thermo-jet heating system, exhibited at the Safety Car Heating & Lighting booth, is an interesting demonstration of the positive temperature regulation that can be obtained. The recent orders from roads that have tried one or more thermo-jet equipments is the best indication of this heating system's merits.

All the railway representatives of S. F. Bowser & Co. are staying at the Marlborough-Blenheim. These include: C. A. Dunkelberg, treasurer; F. T. Hyndman, eastern manager, and E. H. Barnes, southern manager. W. T. Simpson, western manager, expected to attend the gatherings this year, but was called to the Northwest, and could not arrange his return in time to leave for Atlantic City.

Included in the exhibit of the Standard Coupler Company, New York, is the type C malleable iron friction draft gear of 125,000 lbs. capacity and the type K all-steel friction draft gear of 180,000 lbs. capacity. Both of these gears have had many years of service. The Sessions standard friction draft gears are made with a combined spring yielding and frictional resistance, with a small reactive force or recoil and allow a positive release at any point in the stroke.

The Garlock Packing Company, Palmyra, N. Y., has in its space, 510, samples of its number 950 gasket for triple and brake valves, pump heads, steam, air and ammonia pipe lines. This is one of the new products of this factory and is claimed to be most economical and efficient in every way. Garlock style number 2200 air pump packing and style number 3200 throttle packing are shown. These packings are known to railroad men the world over. Style 333-549 steam hammer packing is a product that is said to withstand from 12 to 15 months' service with ordinary care. In addition to the above are shown Garlock high pressure packings number 200 and number 1906, a hot water packing, as well as its locomotive metal packings, numbers 870 and 826. As a whole, the collection presents a most comprehensive assortment of packings for railway use.

### HALE & KILBURN COMPANY.

This new organization is the successor of the well-known Hale & Kilburn Manufacturing Company, Philadelphia, Pa. Francis H. Greene, formerly director of purchases for the New York Central lines, is president. Attractive convention exhibits have been the invariable rule of this company in the past, but the present display surpasses, both in size and char-

acter, any hitherto made. This company was one of the first to develop the finer grades of steel passenger car construction, being in advance of conditions in the new art and anticipating its needs in pressed steel work, such as steel car interior finish, steel doors, steel sash and many other parts.

An entire steel compartment forms a part of the exhibit. It is full size and complete in every detail, being fitted with steel chiffonier, metal open bed, metal sofa, folding upper berth, steel lavatory and other articles. The interior and exterior are beautifully finished in hard white enamel, and indicate the possibilities of elegant finish to be secured on steel surfaces. The Walkover car seat is shown in numerous patterns and varied colors of upholstery. The all steel types of the Pennsylvania, the Lehigh Valley, the Harriman lines and the Long Island are there, with the new Baltimore & Ohio seat and many others.

The exhibit includes also parlor car and reclining chairs.

### BETWEEN THE AQUARIUM AND THE HIPPODROME.

C. B. Adams says he can sell anything, but wants to work along the line of least resistance—and the kind regard he has for safety equipment speaks volumes.

Strange how a man gets confused. J. G. Van Winkle is usually right there with convincing talk; but when the system is as simple as Thermo-Jet, he doesn't unwind fast enough.

A. C. Moore, resplendent with smiles and white flannel, satisfied with the past, making the present show results and optimistic for the future, has absorbed so much Pintsch light enthusiasm while at Atlantic City that he is often mistaken for Julius.

George E. Hulse makes one wonder how he can be so agreeable all the time. "Well," says he, "they all go away so enthusiastic about our axle lighting equipment, it kinder keeps me cheered up."

"I'll be back later, Garland; my wife isn't familiar with heating equipments." The wife resented the inference and stayed. When Billy had explained Thermo-Jet, she said something about not freezing or roasting in a car hereafter if she had any influence. They carried away a Thermo-Jet circular.

J. S. Henry is somewhat despondent. He worked up an elaborate campaign of education in car heating for Harvey in Canada. Then the Safety company produced that Thermo-Jet hot water regulation, which needs very little demonstrating. Now he has to sell Pintsch plants to use up his energy.

William St. John, the dean of the Safety company's sales department, has been compelled to forego the pleasures of meeting his many railway friends. He is recuperating at Mt. Clemens, Mich. The boys missed that expansive smile and hearty handshake on his seventy-second anniversary of his birth.

George H. Chadwell, the real sport of the Safety company, has a swelled head; and all because he recently sold 200 Thermo-Jet installations for heating cars in a foreign country.

### RALSTON DROP BOTTOM GONDOLA.

The Ralston Steel Car Company, Columbus, Ohio, has built to date, 7,000 gondola cars with its drop bottom device. It is exhibiting a car built for the Cincinnati, Hamilton & Dayton, which embodies the latest design for this class of car. It has a capacity of 50 tons and weighs 38,500 lbs. It has 12 drop doors, which are operated by a crank arm shaft moved by hand lever with ratchet, as in the company's previous practice; but the principal change is in the location of the ratchet and lever on the side of the body bolster instead of on the end sill.

The car is 41 ft. long, 9 ft. 3 in. wide and 8 ft. high from



rail to the top of car side. The sheets used throughout the car are  $\frac{1}{4}$  in. thick and the stakes are  $\frac{1}{4}$  in. thick in the usual pressed form. The center sills are in an A-shaped section, 23 in. deep, consisting of two webs  $\frac{1}{4}$  in. thick, which are reinforced at bottoms with 4-in. x 3-in x  $\frac{3}{8}$ -in. angles, and the webs are joined into a single member at the

top, the angular shape allowing clearance for the drop doors and the section providing for an equivalent of two center sills.

The body bolster has a deep web  $\frac{3}{8}$  in. thick, with angles on both sides. The principal equipment consists of Cardwell friction draft gear and Simplex truck bolsters, brake beams and couplers. The brakes are Westinghouse, with the K2 triple.

#### AMERICAN INGOT IRON.

There is an interrelationship between all things mechanical by which they are held together in a way that cannot be broken. So, though American ingot iron is used mainly for culverts, where its anti-corrosive properties are especially valuable, it will also find a place wherever there are corrosive elements at work, as in smokestacks and overhead structures where the fumes from locomotives have a chance to work. With the new mills that are in course of construction opened and the product upon the market in larger quantities than are now available, there will be found places where its qualities can be used to advantage. As an example of this, it would seem that it would be especially valuable for boiler tubes, for which its strength, ductility and ability to resist corrosion should make it especially suitable. As it stands, it has made a reputation for itself for culvert construction, and is used all over the United States, from Maine to California in that class of work.

#### OXY-ACETYLENE WELDING AND CUTTING.

Several railways are using oxy-acetylene apparatus for welding and cutting metals. The hardest steels can be cut as easily as the softest, and, with the aid of hydrogen, plates up to 24 in. thick have been cut. The International Oxygen Company, New York, owns the American rights for gas producing appliances of two French concerns, one of which, L'Electrolyse Francaise, has the largest plant in France devoted exclusively to the production gases, as well as auto-welding and oxy-cutting appliances. The system has been in use in Europe for over 10 years with very satisfactory results.

In order to produce the best results in welding, cutting, or other operations, it is essential that the gases used should



50-Ton Ralston Gondola, Showing Crossbearers and Drop Doors.

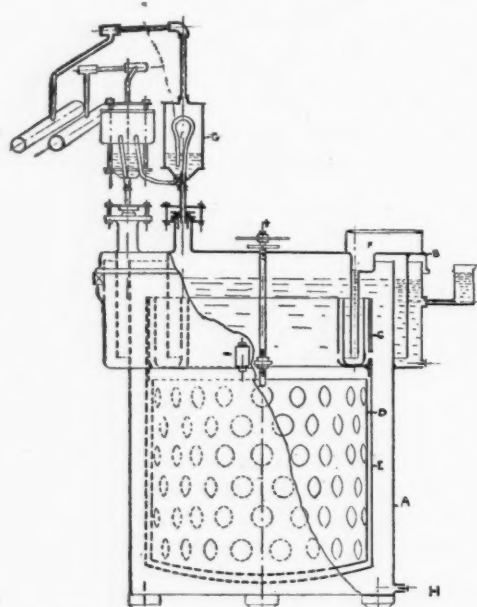


50-Ton Ralston Drop Bottom Gondola Car. View Showing Doors Open.

be of the purest character. Oxygen which contains the least impurities is the most economical in the end, as it is the most efficient. If it should contain any portion of inert gas, like nitrogen or chlorine, for every per cent. of such impurity, the percentage of efficiency will be reduced many times.

The oxygen and hydrogen produced by the International Oxygen Company system are said to be free from impurities; the gases are made electrolytically and can never contain either chlorine or nitrogen. Hence, such oxygen when combined with pure acetylene or hydrogen will give a flame of maximum efficiency, and less of it will be consumed for a given amount of work than of oxygen obtained from any other source.

The aim of this company is to enable a manufacturer to produce pure oxygen and hydrogen on his own premises, and it is now placing on the market equipments of various capacities, suitable to the individual needs of manufacturers. These plants are simple and reliable in operation, require no expert attention and cost very little for maintenance.



Sectional View of I. O. C. Generator.

A—Outer Electrode. B—Cover. C—Hyd-Joint. D—Inner Electrode. E—Hole in Cover. G—Lantern. H—Porcelain Supports.

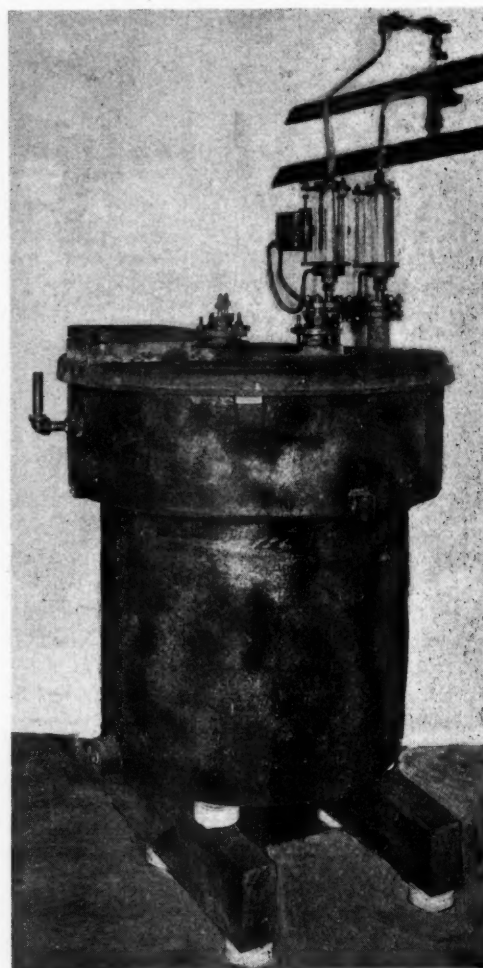
ance. The cost of producing the gases is practically that of the cost of electrical current. This system for producing oxygen and hydrogen consists of a group of oxy-hydrogen generators. Each generator is an electrolytic cell, which by the aid of electric current decomposes water into its constituent parts—oxygen and hydrogen.

It works as simply as an electroplating apparatus. Instead of separating copper, silver or some other metal from a solution, the generator separates oxygen from water, which contains some alkali to make it a better conductor. As water is made up of one part of oxygen and two parts of hydrogen, the hydrogen is set free simultaneously with the oxygen and both gases become immediately available.

The construction of the generator is as simple as the principle by which the gases are produced. An iron tank serves as the negative pole. From the cover of this tank are suspended a hydraulic joint and a perforated tank which serves as the positive pole. By means of an asbestos sack suspended from the hydraulic joint, two separate compartments are formed. Through an opening in the cover, a solution of water with alkali is poured into the hydraulic joint and distributed in the two compartments. When current is sent in the generator oxygen immediately forms on

the walls of the inner tank, and hydrogen on the walls of the outer. The two gases are thus produced in separate compartments and are therefore absolutely pure. As a further check against any possible mixing of the gases the asbestos sack when impregnated with the alkali solution, forms an effective wall between the two gases.

The hydraulic joint automatically adjusts the inner working of the generator. The oxygen and hydrogen do not pass directly from their respective compartments to the off-take pipes, but first bubble through the water placed in the lanterns affixed to the cover of the generator. By means of these, one can see at a glance how the generator is working. All that is needed is to add distilled water daily to make up for the quantity decomposed into the oxygen



I. O. C. Generator for Producing Oxygen and Hydrogen.

and hydrogen. The gases can be produced whenever needed and for whatever length of time required.

A plant for producing these gases being made up of a group of units is very flexible. The units can be arranged in single file and double file; also in many rows and tiers. A group of generators may contain just enough units for only one torch, or it may be great enough to generate thousands of feet of gas. In addition to manufacturing these generators at its Waverly Park (Newark, N. J.) factory, the International Oxygen Company will also produce oxygen and hydrogen in cylinders.

In determining costs by this system, the following data will be of value: One k. w. h. of current will produce about 3 cu. ft. of oxygen and 6 cu. ft. of hydrogen. Each unit requires about 2 volts and from 300 to 400 amps. The quantity of gas obtained is proportionate to the amperes used. With about 350 amps., about 65 cu. ft. oxygen and 130 cu. ft.



hydrogen are obtained daily. The expense outside of current consumption is very small, the only other material required being distilled water. It takes only 1/100 of a gallon of water to produce 1 cu. ft. of oxygen and 2 cu. ft. of hydrogen.

#### EXTENSION SHANK FOR SHARON COUPLER.

A new development in coupler design, on exhibition in the exhibit of The National Malleable Castings Company, Cleveland, Ohio, is a special shank extension for applying Sharon freight couplers to all classes of passenger equipment. This shank extension, which takes the place of the wrought iron straps ordinarily used, is entirely separate from the coupler and can be made in lengths to suit all conditions. The coupler is attached to the shank extension by regular yoke rivets, bolts and wrought iron or steel keys.

Adjustable pocket or attachment castings are provided for maintaining the center line of draft of locomotive couplers. This is accomplished by elongating the bolt holes in the base plate of the casting and by using washers. These washers can be inverted, as the tires wear and the locomotive and tender settles, thus bringing the center line of the draft gear up to the standard height.

The Sharon coupler for which this extension is designed operates from either the top or the bottom, with a central vertical lift in both cases. It is designed to suit every class of equipment, without any change whatever in the operating parts. The Sharon bottom as well as top operating coupler can be operated from either or both sides of freight and passenger cars and locomotives, as desired. In case of failure of the rear draft attachments of either the top or bottom operating Sharon coupler, it will automatically release and uncouple in pulling out.

#### REFRIGERATOR CAR SEALS.

BY CHARLES V. EADES.

The reliability and efficiency of sealing compound used in insulating refrigerator cars is one of the most important items in the car's construction. To maintain the required protection and be of greatest benefit, it must have a number of known qualities, the following being the most important.

It must be tasteless and odorless, so that no taint or odor will be given to the most delicate of the commodities carried; as many, like dairy, meat, fruit and poultry products, are very susceptible to these odors, which reduce their selling value as articles of food.

It must be elastic under all variations of temperature and adhere to flashings and not crack or run.

It must resist the liquids, gases and chemicals that seep from the multitudinous burdens that are in daily transit, or the alkalies used in refrigeration. Under no condition (vibration, age or chemical) shall it become a dry, hard, dead, inert mass of carbon that will crack or crumble, which if done, proves the material worthless and renders the whole work a waste of time and money, impairs all the insulation and increases the cost of icing and transportation charges.

The cost of re-icing a car once will pay the difference between a good seal and a poor one.

All systems of insulation have some special merit, but none are complete in themselves; they must be properly sealed.

Revenue being the one principal object of transportation companies, and known security of the products transported, the principal factor in basing rates, the showing of the traffic department is greatest when a unit of force will produce the greatest revenue from the tonnage carried, and when the commodities are of regular, steady, daily move-

ment, at highest standard tariff rates, and when the element of loss is reduced to a minimum.

Perishable food products which are susceptible to and absorb any odors or are destroyed by extremes of temperature offer an immense tonnage but require special service and intelligent care.

Perfect security is needed, and the vehicle must be so constructed that an accurate, uniform condition can be maintained over long distances and resist any climatic change no matter how severe, from torrid to intense cold. A failure, even for but a short time, is sufficient to cause an entire loss.

All are agreed on dead air as the theory of insulation; but the opinions vary as to the best means of obtaining it. Hair felt, fibre, quilt, cork, paper and many others have merit, but none are sufficient in themselves. The construction of the car is such that the insulation is interwoven with the car's construction, and broken in many places by bolts, screws, nails and timbers, or careless workmen, which break the air cells and renders the insulation of little value. Any perforation, no matter how minute, has its effect and increases the operating expense.

The writer was in the shops of one of the largest car builders some days ago. They were at work on a big order of refrigerator cars for one of the standard lines. The specifications as to material were being carried out to the letter; but when the inspectors had passed on the material as to brands they were careless or ignorant as to the principal factor or the object of its design and construction—the confinement of the air as the real insulation of the car.

The ignorance of an inspector as to the fundamental principles of insulation is an acknowledgment on his part of his unfitness for his position, as much so as carelessness in carrying out the engineer's instructions.

Over the sills of the car in question (there were several others nearly as bad) had been laid a good quality of three-ply rubber roofing. This has been carefully secured. The workmen, in nailing cleats holding part of the floor insulation, were using the insulation of the sills as a chopping block; and in a distance of about 23 ft. there were 51 holes cut with a hand axe and 12 triangular pieces entirely cut out. This was wilful waste, carelessness, inefficiency and lack of knowledge or interest on the part of the inspector in charge.

There was no repair or seal used in securing their breaks, which should have been done. (This is intended as no reflection on the engineer, but on general factory conditions).

Some time the claim department will have to handle claims aggregating great amounts, and will bring in figures to show that rates should be advanced, while the real reason was entirely construction. Had there been a good seal used, and that seal ever ready, any defects could be easily remedied and efficiency maintained.

An intelligent knowledge of the results must be based on facts—not theory—and all work must be directed to that end. Faulty construction and bad or cheap insulation is not economy.

All manufacturers of insulation advocate and use a refrigerator seal, but price and not quality seems to be the one consideration. Nearly all of these manufacturers have claimed to the writer that "competition compels the cheapest material possible for a seal; it's all covered up anyhow, and by the time it is put into service and gets back for repairs, no one will know what was the cause;" and for the saving of a very little money—often but a few cents per car in the first cost of construction—both the claim and operating departments carry an added burden.

Few construction engineers have given this subject very much thought, leaving the question of sealing compound largely to chance or the fact that it can be secured with

the other items, of insulation, or taking the word of the salesman offering it. When the car comes back for repairs and is stripped, the sealing compound is a dry powder, and many of them are valueless even after a few weeks of service. They become hard and brittle, and then the vibration of the car soon reduces them to impalpable dust.

The Standard Asphalt & Rubber Company, Chicago, has perfected the only seal, Sarco Refrigerator Compound, that fills the requirements. It is tasteless and odorless, elastic under all variations of temperature, will resist acids, alkalis or gases, and stand service and remain alive and elastic during the entire life and service of the car. It is in use by several of the standard refrigerator car lines, and is endorsed by some of the best car builders and engineers. When greatest efficiency and economy is desired, Sarco Refrigerator Compound is offered.

#### HOBART-ALLFREE CYLINDERS AND VALVE GEARS.

The Pittsburgh & Lake Erie has had in service during the past year 20 engines equipped with the Hobart-Allfree cylinders and valve gears, made by the Hobart-Allfree Company, Chicago, and its management is so well satisfied with the results that the same equipment was ordered for the five passenger engines recently built for the road by the American Locomotive Company.

This improved locomotive cylinder and valve gear is also applied to 20 Mallet locomotives and 50 old locomotives on the Mexican National. It has been somewhat simplified by having the compression valve connected to the combination lever in the Walschaert's or similar valve gears. In the exhibit the combination valve is shown full size; and the general arrangement of cylinder valve and gear is well illustrated by a model which is an exact reproduction, one-quarter size, of the equipment on the Pittsburgh & Lake Erie passenger engines. The principal advantages claimed for the Hobart-Allfree cylinders and valves are as follows: The cylinders are designed with short ports and the exhaust passages are separated and insulated from the live steam passages; consequently the heat losses from radiation and condensation are greatly reduced.

The waste spaces in the cylinders are reduced to the minimum. In common practice this amounts to at least 10 per cent. of the piston displacement, while these cylinders have not more than 2.5 per cent. Having an increased area of about 50 per cent., this system produces a quick and large opening of exhaust, discharging the exhaust steam freely. This greatly reduces back pressure in the cylinders, and owing to the sudden release, a better fire is maintained even with an enlarged exhaust nozzle.

In the return or exhaust stroke of the piston the exhaust is not closed until very late in the stroke; but when the proper point is reached, enough exhaust steam is entrapped in the cylinders and small clearance spaces to produce sufficient compression to answer the mechanical needs of cushioning.

In the Allfree system a single valve correctly controls admission, cut-off and release the same as in the standard engine, except that a sufficient amount of exhaust lap is used to carry the steam to a point that will give a greater expansion. To avoid an early closure, a small piston valve, called the compression valve, is introduced through a section of the ports beneath and to one side of the main valve, and this has only the function of controlling the compression and providing greater freedom for the escape of exhaust steam. While the two valves release at the same instant, the compression valve in closing falls about  $1\frac{1}{4}$  in. behind the main valve. The clearance having been reduced to  $2\frac{1}{2}$  per cent. of the piston displacement, a sufficient amount of compression takes place to cushion perfectly the reciprocating parts.

#### NEW McCORD JOURNAL BOX LID.

The part of a journal box most likely to give trouble is the hinge pin, as it is in constant duty; and, while this duty is light, the fact that it is unremitting will develop defects, if any exist. The results of such defects are box lids missing, inoperative, or, by reason of wear of the bolt, ineffective. The accompanying cuts show the construction and operation of the new McCord

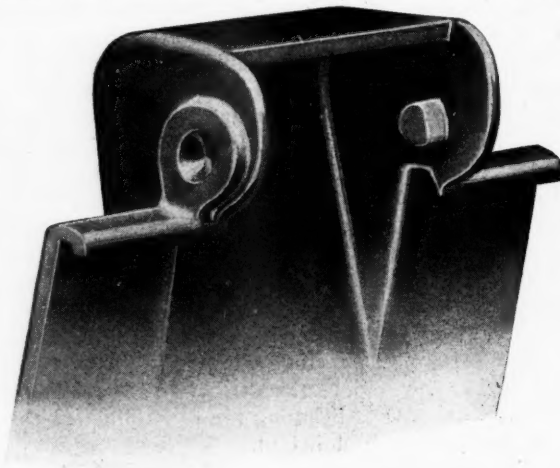


Fig. 1. McCord Journal Box Lid.

Pinless box, designed to eliminate the troubles due to hinge pins, made by McCord & Company, Chicago.

For the different types of hinge pins are substituted two bosses (Fig. 1) about  $\frac{1}{2}$ -in. long, cast integral with the lid and projecting  $\frac{1}{2}$ -in. inwardly from the side of the lid, in the same location as the hinge pin would be. These bosses are not round, but have a segment of the circle cut away so that the diameter in one direction is less than in the others. A slot (Fig. 2) is cut through the top of the lug slot the same width as the small diameter of the bosses and at an angle to the lug slot. The lid is applied to the box by rotating it until the small diameter of the bosses and the slot coincide (Fig. 3), when the lid drops down into the proper place. The position

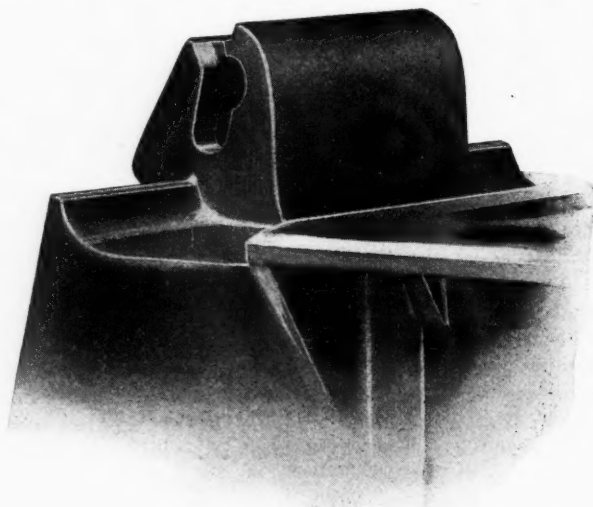


Fig. 2. McCord Journal Box Lid.

in which the lid is applied is one it cannot assume under any service condition, and is such that it cannot be removed without a special tool. When the lid is rotated to open it, it rises to the top of the slot, the large diameter of the bosses is across the small slot and they therefore cannot get out (Fig. 4). There is no wear on these bosses, because when the lid is closed the



center bearing action of the McCord spring forces the lid against the face of the box; and when it is in the closed position the bosses (exactly as the pin in the ordinary McCord box) are not in contact with either the front or the back wall of the lug slot.

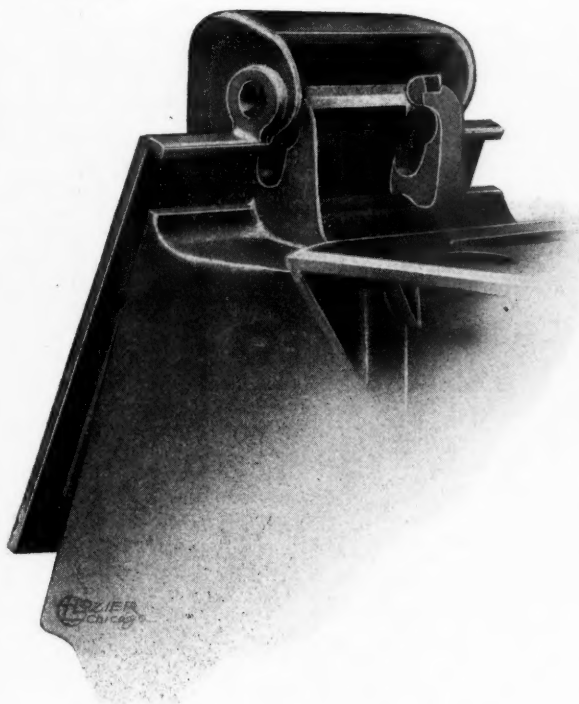


Fig. 3. McCord Journal Box Lid.

The principle of interchangeability of parts has been carried out, so that for repairs the M. C. B. lid, the old flat spring McCord or the more recent improved coil spring McCord lid can be applied for repairs if necessary. As lid repairs to boxes are almost entirely due to pin failures, and as there is no pin

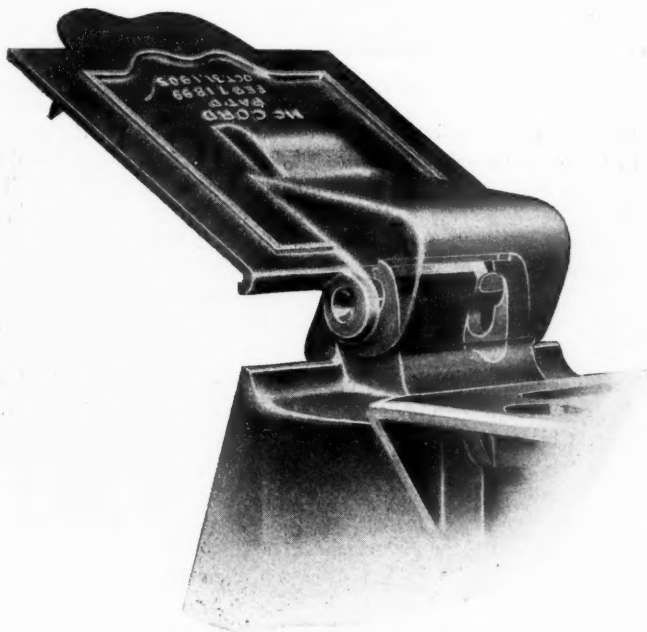
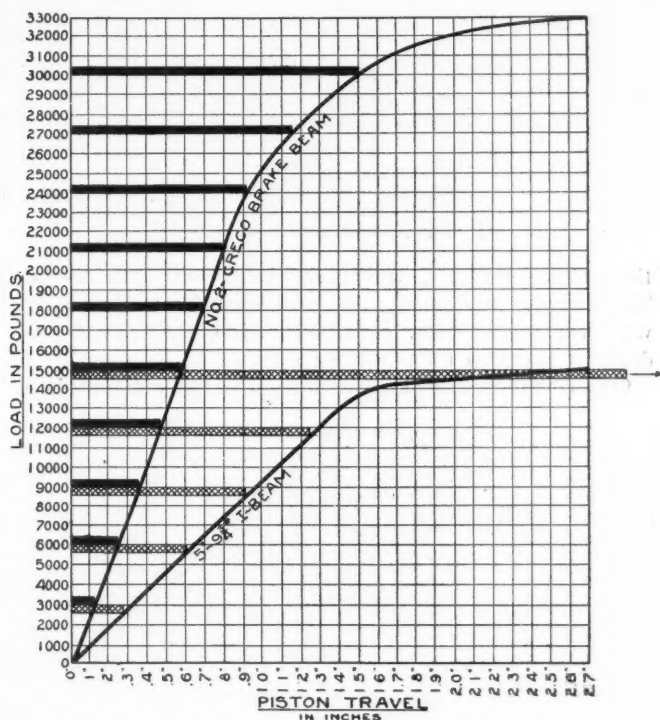


Fig. 4. McCord Journal Box Lid.

in this lid, it is not expected that any repairs will be necessary. A number of these boxes have been in service for the past two years, and one box, which has run over 180,000 miles in the hardest kind of passenger service for the past 18 months, can be seen at McCord & Company's space.

#### DEFLECTION OF BRAKE BEAMS.

The test of brake beams usually concerns the deflections of the beams under various loads up to the elastic limit. A slight motion of the beam due to deflection is multiplied by the total brake beam leverage, and its effect on piston travel is important, the stiff beams having an advantage over those with a greater deflection. The diagram illustrates this difference in effect upon piston travel of the M. C. B. No. 2 Creco brake beam, made by the Chicago Railway Equipment Company, Chicago, and the ordinary 5 in. 9 $\frac{3}{4}$  lbs. I section brake beam. It will be noticed that while the deflection of the I-beam at 6,000 lbs. load results in a piston travel of over  $\frac{1}{2}$  in., the deflection of the No. 2 Creco only causes  $\frac{1}{4}$  in. At 12,000 lbs. the I-beam deflection causes a piston travel of  $1\frac{1}{4}$  in. on an 8 to 1 brake leverage, while the Creco deflection gives a piston travel of about  $\frac{1}{2}$  in. The I-beam collapses at 15,000 lbs. load



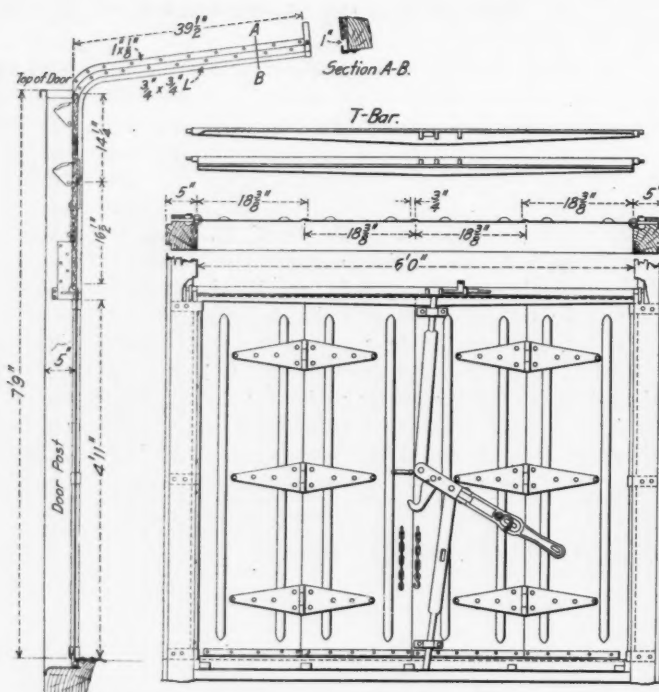
Deflections of Creco and I-Section Brake Beams.

and would allow the piston to bottom itself against the brake cylinder head, while the No. 2 Creco beam would allow piston travel of only a little over  $\frac{1}{2}$  in. at the same load. The importance of controlling piston travel and of not allowing it substantially to exceed the normal movement is fully appreciated and the effect of brake beams in this respect is clearly shown by this diagram.

#### WILLIAMS ALL-SERVICE CAR DOOR.

The Williams door, illustrated herewith, was designed by W. S. Williams, superintendent of the Illinois Central at Clinton, Ill. It has been in service for three years. It is a steel-hinged folding door, each side having two parts, and the attachment to the wooden door posts is partially recessed and arranged so that the door can swing in either direction.

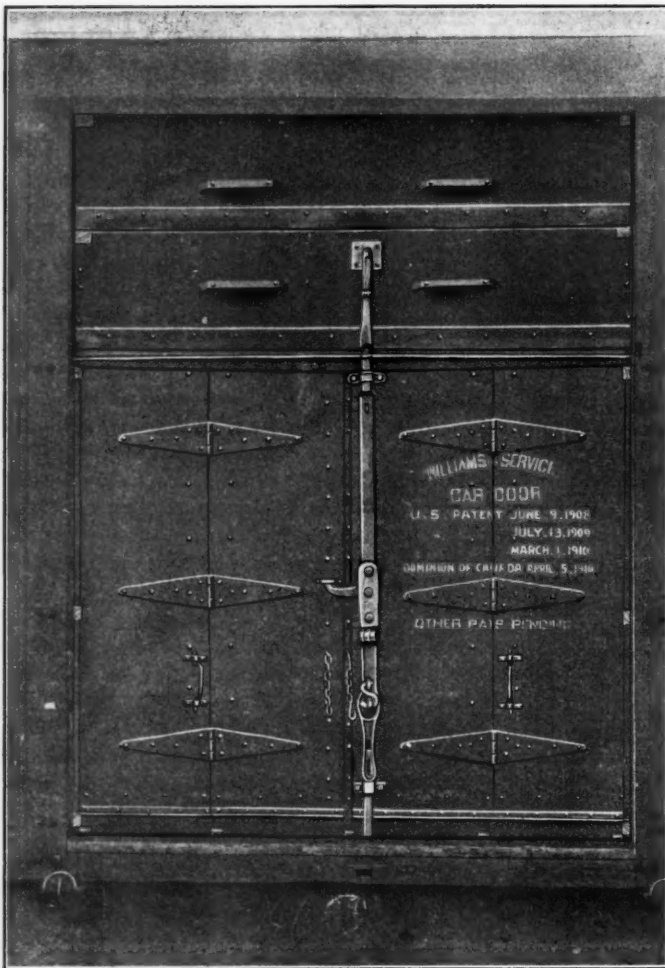
The swing doors are fastened by a latch somewhat similar to that used on refrigerator cars, and the door sill is arranged with a flanged portion so as to make it waterproof. The main hinged doors are about 5 ft. high and are made of sheet steel  $\frac{1}{8}$  in. thick. Above these there is a metal T-bar, which serves to stiffen the attachment of the upper part of the hinged doors and to make a bass support for



Details of Williams All-Service Car Door.

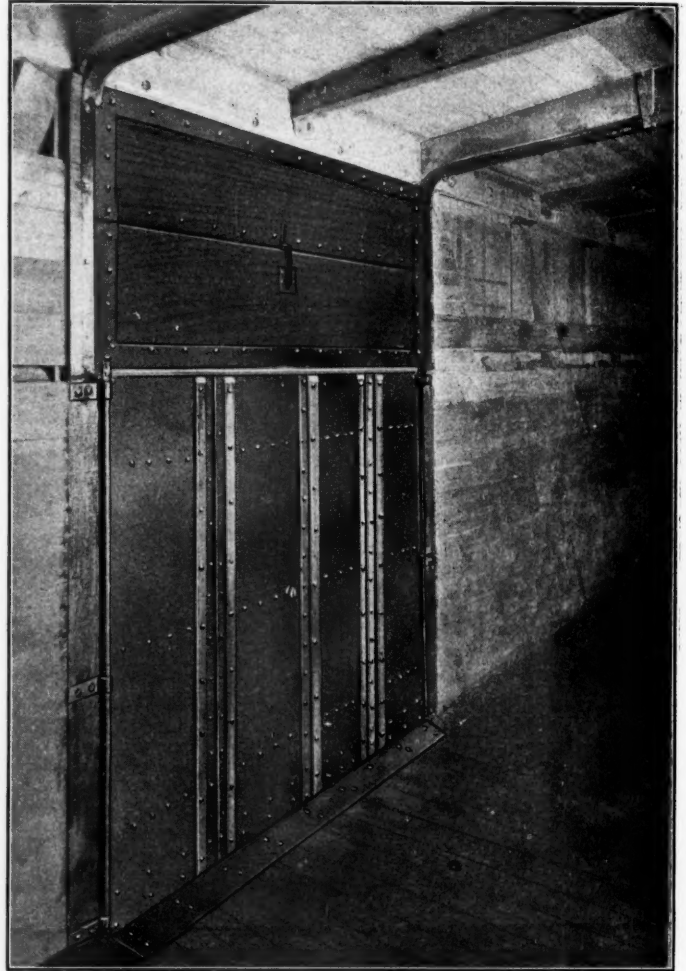
the rolling shutters, which are folded up into the roof. These upper folding doors are made of wood and bound with iron straps. The construction is clearly shown in the drawing and two photographic views.

One of the principal advantages claimed for this door is



Outside of Williams All-Service Car Door.

that it can be released in five seconds; a car of grain can be completely unloaded in 25 to 30 minutes, and the door replaced and closed in five seconds. The ordinary car door when closed to the elevator requires 15 to 20 minutes to be released so that the grain will run out. An important ad-



Interior of Williams All-Service Car Door.

vantage connected with the use of this door is the saving in the cost of wooden doors. The steel portion of the door weighs 600 to 700 lbs., or about 1,300 lbs. per car. The Williams All-Service Car Door Company, Clinton, Ill., is prepared to put on these doors for trial for any road desiring them.

#### AIR COMPRESSOR USED FOR CONVENTION EXHIBITS.

The compressor used for power purposes at the exhibit of this convention was built by the Chicago Pneumatic Tool Company, Chicago, and is known as its class GCB. It is of two-stage type, low pressure cylinder being 16 in. in diameter, the high pressure cylinder 10 in. in diameter, and the stroke 12 in. The compressor has a capacity of 419 cu. ft. of air when operating at a speed of 150 r.p.m. to a final pressure of 100 lbs. and is driven by a 75 h.p. Western Electric Company's motor with an automatic starter, the receiver being of the vertical type 42 in. in diameter and 8 ft. high. The compressor is entirely self-contained, and has a heavy single piece cast iron sub-base. The main bearings and cross head guides on each side are a single casting, the air cylinders being bolted to this and overhanging, thus making the operating parts accessible, and permitting uniform expansion of the cylinders.

The frames are heavy, box-shaped castings with double bearings, set on an angle so that the thrust is taken on the solid



metal of the bearings. The cross head guides are bored concentric with the cylinder. The shaft is especially heavy single-piece steel forging, with cranks at 90 deg. The belt wheel is 84 in. in diameter with a 16-in. base, and made heavy enough to insure smooth running at a moderate speed. The connecting rod is a solid, single-piece forging with heavy marine type crank pin bearing. The cross head is a single casting with adjustable taper shoes turned to fit in the cylindrical guides. The piston is of the solid type with cast iron spring rings. The air cylinders are cast of special mixture iron; they are simple in design and free from complicated passages and are cast heavy enough to stand re-boring. They are water-jacketed throughout and have water-jacketed heads. The air inlet valves are of Corliss type, mechanically operated by eccentrics on the main shaft, the design being such that the port area is large and the clearance is reduced. The valves open rapidly and shut quickly without hammering or causing excessive wear due to unnecessary movement. Owing to the valves being operated by independent eccentrics, it is possible to obtain close adjustment. The parts of the valve motion and the valves themselves are readily accessible for examination or repair; the wearing parts are of generous proportion and the bearings provided with phosphor bronze bushings and improved adjustments. The discharge valves are of the Chicago pneumatic poppet type with removable guides and are automatic in operation. The valves, being of the cup type, with external guide, move freely and without the use of excessively heavy springs.

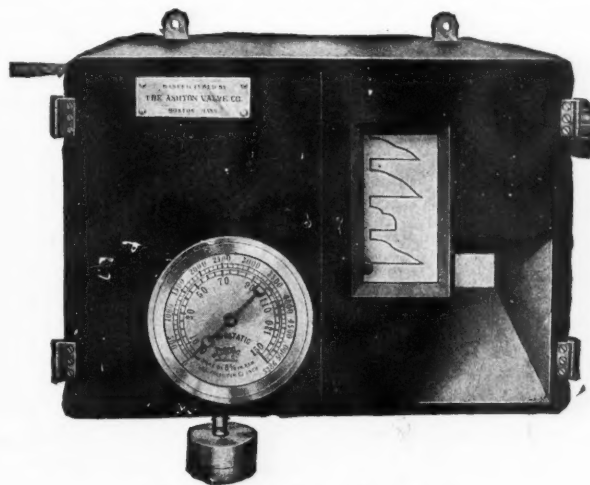
The air intercooler between the two cylinders is of the unit type, consisting of a nest of tubes, secured to suitable head plate, which slip into a containing chamber in the base and directly under the air cylinders. The construction is such that the tubes are free to expand under the influence of varying temperatures without causing leakage. The connection between the intercooler chamber and the cylinders is made by pedestals connecting with the under side of the cylinders, these pedestals in addition to forming the passage or connection between the cylinders and the intercooler give a more rigid construction than where the cylinders are supported by the frame alone. The regulation is effected by an automatic throttling unloader of simple and substantial construction, and is connected with the receiver, and provided with weight adjustment so that the working pressure is maintained in the receiver at a constant and predetermined amount. In principle, this unloader consists of a throttling valve on the inlet side of the low pressure cylinder, the amount of opening being automatically proportioned to the service demands so that the air taken in by the compressor is only that required to maintain the constant predetermined pressure in the receiver.

#### WHEEL PRESS RECORDING GAGE.

The Ashton hydraulic wheel press recording gage, illustrated herewith, is made by the Ashton Valve Company, Boston, Mass. It is the result of a recent invention that has been developed as a machine that will assure the accurate mounting of wheels on axles. The recording gage, by its own record, shows the fit throughout the length of the wheel hub from the entrance of the axle to its full travel, being a record of the operation from the start to the finish. The importance of this information is essential, for the application of too much pressure will strain wheels, making them liable to burst, while easy fits with too low a pressure applied results in wheels working loose. The Ashton wheel press recording gage can be readily attached to any hydraulic wheel press. It is so constructed that the operator cannot get at the record to change or alter it in any way. There is an opening provided in the front of the outside casing so that there can be written, or stamped, on the chart, directly opposite the record of the wheel fit, the pressman's name

or number, wheel fitter's name or number, the size of axle and the number of wheel.

The machine has a capacity for 300 records, or 150 pairs of wheels. These records are made on a single continuous paper roll, or chart, 5 in. in width, and as each roll becomes filled it can be quickly removed and filed for future reference and a new record roll inserted in a short time. The

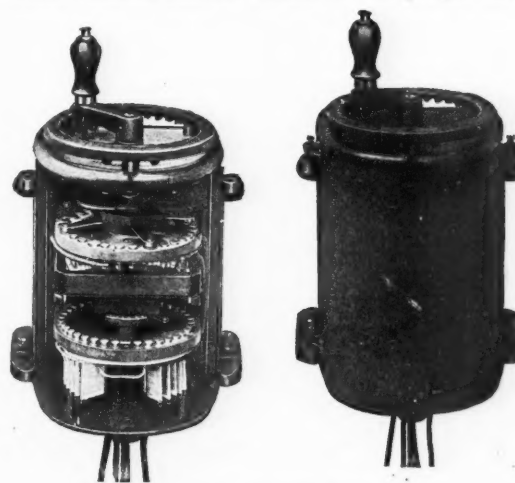


Wheel Press Recording Gage.

chart works vertically from a lower to an upper reel, and operates only on the forward stroke of the ram, moving 1/16 of an inch to every one inch movement of the arm. On the back motion of the ram the chart remains stationary. The use of plain paper charts is an advantage over expensive ruled paper, and by eliminating clock movements there is nothing that requires winding or adjusting.

#### WESTINGHOUSE CONTROLLERS FOR SHOP USE.

The accompanying illustrations show types of machine tool controllers made by the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. They have been designed with special reference to ease and accuracy of operation and facility of repair. The operation of the motor is controlled by a single handle which remains securely locked at the proper notch until

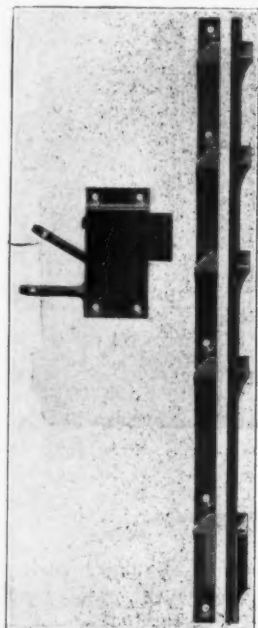


Westinghouse Electric Controllers.

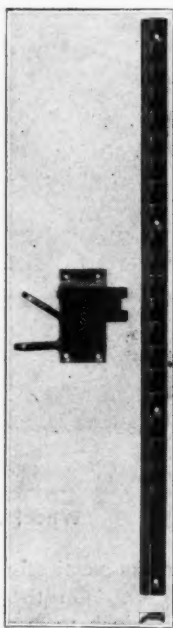
released by the operator. The controller can be mounted in any convenient position, or the handle can be removed and mounted on the carriage so that it will travel with the work. Automatic machine tool controllers give great assistance to the operator. The motor is started, accelerated, and brought to the desired speed automatically, and it can be controlled by master notches placed wherever desired.

**CAR WINDOW SASH LOCKS.**

The Universal No. 10 sash locks, manufactured by the McCord Manufacturing Company, Chicago, wedge by gravity, using the weight of the sash. The beveled surface of the lock bolt in contact with the rack, giving downward and outward



Universal Gravity Sash Lock.



Universal Wedge Sash and Lock Rack.

bearing surface along which the bolt slides by force of gravity, wedges the sash against the outside strip and tends to prevent all rattle.

The illustrations show the Universal No. 20 wedge sash and lock rack, and the No. 10 lock.

**BOSS NUT LOCK.**

The lock nut shown in the accompanying illustrations, made by the Boss Nut Company, Chicago, is a natural thread lock



Boss Nut Applied and Locked.

nut for use on cars, track, frogs, crossings; in fact, for use anywhere that a simple, positive, vibration proof, locking device is required. It is made of special mild steel and is double



Boss Nut Applied; Not Locked.

concave in shape, being applied either way and run on a bolt with the fingers like any ordinary nut. When brought square with the home nut, the Boss nut bears on the two outer edges

only; and as the nut is wrenched tight, the inner arch of the Boss nut is flattened, causing the outer surface to draw downward and inward until the threads of the nut are sunk deeply and tightly to the root of the threads of the bolt. It automatically takes up variation in bolts due to defective manufacture, wear, etc., and may be used repeatedly, as it does not destroy threads of the bolts, is labor saving and does not require the service of an expert mechanic to apply it, for the tighter you wrench the Boss nut, the tighter you lock it.

**ADLAKE CASTING.**

A small frame which hangs at the entrance of the general offices of the Adams & Westlake Company, Chicago, contains a casting which was made in the new shop of the Adams & Westlake Company nine days after the Chicago fire of 1871. The fact that any casting could have been made so soon after so great a disaster speaks much for the energy and resourcefulness of the company that made it. The Adams & Westlake Company has now been serving the railroads for 50 years.

**NATIONAL SASH LOCK.**

The improved National sash lock, made by the National Lock Washer Company, Newark, N. J., is designed to lock and absolutely hold the window at any desired height. It is made of special alloy, and, it is claimed, can be subjected to the most severe treatment without showing any signs of wear. The fact that it can be applied without mortising is of special importance as regards application and maintenance. But one sash lock is recommended for each window.

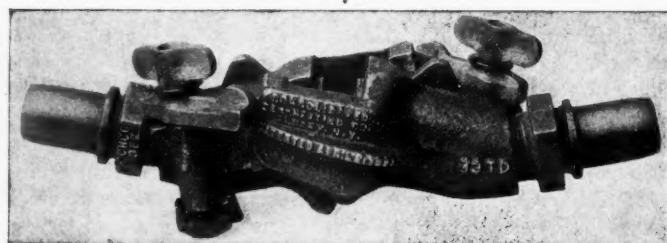
**NEW CONSOLIDATED COUPLER WITH POSITIVE LOCK.**

The Consolidated Car-Heating Company, New York, recently placed on the market a new type of coupler, No. 33TDX, for use between engine and tender and where high pressure steam is carried in the train line for operating electric lighting generators



Consolidated Hose Coupler, Connected and Locked.

in baggage cars. This coupler consists of their standard two-piece coupler head of the slide-gasket type, equipped with a positive lock. One of the accompanying illustrations shows a



Consolidated Hose Coupler, Uncoupled.

pair of these couplers connected and locked together. The other shows the small amount of lift to the heads necessary for coupling and uncoupling, a feature which has much to do with



the life of the steam hose. This point of advantage is produced by the correct angle of the nipples, which allows the couplers to hang naturally when in service.

These couplers give a steam tight joint and when furnished with the Consolidated two-piece hose clamps and high pressure steam hose they make a steam connection that is cheap and easy to operate. They are on exhibition at booths 579, 580.

#### GASOLENE ELECTRIC MOTOR CAR.

The General Electric Company, Schenectady, N. Y., is exhibiting a gas-electric car of the standard type. Its length is 66 ft. 1 in. over the bumpers; its width is 10 ft. over the sills and 10 ft. 4¾ in. over the belt rail, and the overall height is 14 ft. 1 in. The car is divided into four compartments, the forward one being the cab, 11 ft. 5 in. long, in which all the motive equipment is placed. Immediately to the rear of this is a 6 ft. baggage room, and lying between the baggage room and center entrance is a smoking compartment 12 ft. 5 in. long. Directly back of the center entrance is the main passenger compartment 32 ft. 5 in. in length, with a circular observation rear end. The seats are somewhat longer than the standard car seat, namely, 47½ in., and will accommodate three persons. The circular observation end accommodates seven persons. On the basis of three in each of the longer seats, the smoker will accommodate 28 and the passenger compartment 69, making a total of 97 in all.

The trucks are standard M. C. B. design throughout. The forward truck, upon which are mounted the two driving railway motors, one on each axle, has a wheel base of 6 ft. 10 in. The rear or trailer truck has a wheel base of 6 ft. The wheels are 33 in. in diameter with M.C.B. standard treads and flanges. The distance between the bolsters is 50 ft. 7 in., making a total overall wheel base of 57 ft. The equipment under the car has been so arranged that the trucks have a clearance for a minimum radius of 150 ft. The car in operating condition weighs 45½ tons, 66 per cent. of the weight being on the driving wheels and therefore available for traction. The car has a maximum speed of 50 m.p.h. The interior finish of the car is a high grade mahogany. The ceiling is of composite board painted dark green with gold stencil decoration. The upholstery of the seats in the passenger compartment is green friezette plush and that in the smoking compartment green Spanish leather.

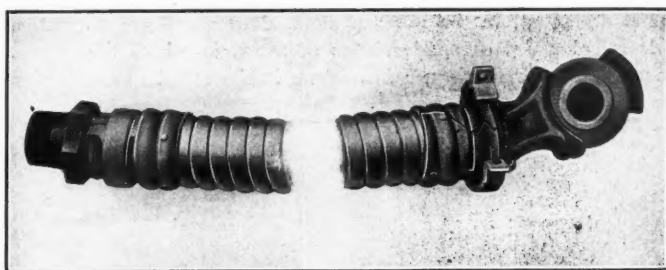
The car is provided at each end with ¾ type automatic couplers of M. C. B. contour. The equipment of the car consists of the main gasolene engine set comprising an 8-cylinder, 4-cycle, engine direct connected to which is an 8-pole commutating field self-excited generator. The generator out-board bearing is housed in a three-arm bracket, ring oiled. An auxiliary gasolene engine set comprising a 2-cylinder, 4-cycle, 10-h.p. engine direct connected to a single cylinder air pump and lighting generator, furnishes an initial charge for the air tanks and supplies current for illumination and ceiling fans. A field voltage controller transmits the power from the generator to the railway motors mounted upon the front truck. The car is heated by a coal-fired Baker hot water heater, and so arranged that the water from the heater may be admitted to the engine radiators to prevent freezing during lay-overs in cold weather. The radiators, which are of the fin-tube type, are mounted upon the roof of the cab, circulation being maintained by thermo-siphon system. A standard equipment for straight and automatic air brakes and air signals, together with pneumatic gong and air sanders, are included.

The main gasolene engine is started by air admitted through an air-starting valve mounted upon the cap plate of the electrical controller to rotating valves driven from the cam shafts. An air pump is direct driven from the main engine

shaft. This has a capacity of 22½ cu. ft. of free air at 550 r.p.m., the normal speed of the engine; gasolene and air pumps are similarly driven. Gasolene is pumped from the tank beneath the car to chambers in the carbureter. For initially charging these tanks a hand pump is provided. The engine is lubricated by system of forced feed with ducts in the crank shaft. The ignition consists of two low-tension magnetos and make-and-break spark plugs. The magnetos are provided with automatic centrifugal switches to prevent the engine exceeding a safe speed. The motors are of standard railway commutating pole type, each rated at 100 h.p. on the standard basis.

#### ARMORED AIR BRAKE HOSE.

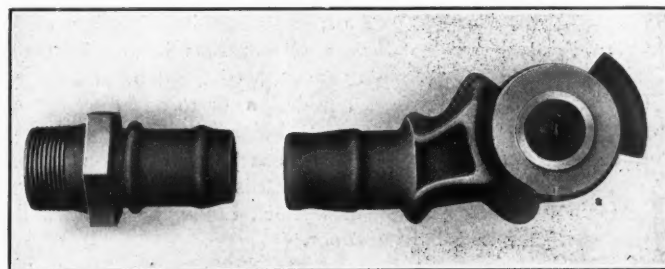
The Sprague Electric Works, New York, are exhibiting, in space 386, a new design of 1¾ in. air brake hose. It is designed to allow the use of fittings that conform to the standard use with M. C. B. hose. The illustrations show the



Armored Air Brake Hose.

hose mounted, also the coupling and nipple before applying. It will be noted that the coupling and nipple are suitable for use with either M. C. B. standard hose or flexible steel armored hose. The M. C. B. clamps secure the armor and hose, and in such a manner as to eliminate the blowing out of fittings. This is accomplished by the M. C. B. clamp bearing upon the pressed steel armor clamp, the latter being securely riveted to the armor on one end, and engaging the fitting on the other end.

The armor clamp is secured by four rivets through the high part of the armor convolutions, thus preventing the



Hose Nipple and Coupling.

heads of the rivets from chafing the rubber hose. This armor clamp does not compress the armor, and it is stated that the fittings are applied without any more trouble than with the M. C. B. hose.

The maker claims that the rubber hose within the steel armor cannot rupture, even though the puncture or defect exists; it is also claimed that when this hose deteriorates in time, only a small puncture can occur, and not of sufficient extent to necessitate replacing before arriving at the terminal. The armor protects the hose against kinking and chafing, and eliminates the expensive practice of removing such damaged hose, in order to avoid delay to trains. Furthermore, the enclosed rubber hose, not being subject to the deteriorating effect of stretching, will result in increased life.

**FORSYTH ONE-PIECE METAL DOORS.**

Forsyth Brothers Company, Chicago, has for some time made a one-piece metal door, in which the framing and panels are formed out of a single sheet of metal. Formerly, metal doors were built up in sections—the frames being made up of separate parts riveted or welded at the corners; and, likewise, the panels and finish of the door were composed of separate parts, similarly attached to the frame of the door. It was found that, under the constant racking action on the part of the door when the cars were in motion, the joints and seams made of separate parts would tend to open, permitting the entrance of moisture in the interior of the door, causing rust. Where light metal sheets are overlapped and riveted together, it must be evident that either the rivets themselves, or the rivet holes in the light metal, become elongated, in either case giving rise to a gradual motion in the similar parts. Where there is a marginal overlapping of sheets of steel, moisture enters, and rust commences at these points. The Forsyth one-piece metal door was designed to overcome these defects in the built-up type of metal door, and in the Forsyth metal door there are no joints.

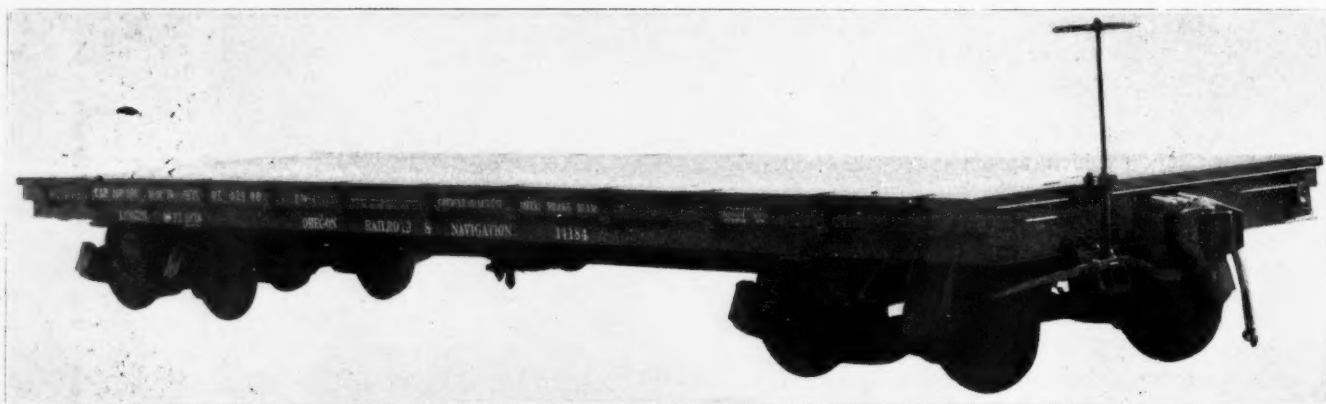
It is composed of single sheets of metal in which the frame, panel, and other finish, are formed up in the metal itself. These

The hardware is securely united to the interior reinforcements, which are, in turn, welded to the interior framework of the door itself; consequently, any strains which may be imparted to the hardware are not transmitted to the shell of the door and do not cause bulging or distorting of the finished surface of the latter. Among other cars upon which these doors are in service might be mentioned a considerable number of electric cars of the Southern Pacific Company and of the Interborough Rapid Transit, New York.

**BETTENDORF FLAT CAR WITH REMOVABLE SIDES AND ENDS.**

The car here illustrated is one of a large order recently delivered by the Bettendorf Axle Company, Davenport, Iowa. The car is a 40-ft. flat car of 100,000 lbs. capacity, having Bettendorf underframe and trucks, to which have been applied wooden slides and ends which are removable from the car, so that the car may be converted back and forth from flat car to gondola as required.

This car is equipped with the regular Bettendorf underframe having a single center sill made from a 24-in. 120 lbs. per ft. Bethlehem girder beam, having flanges 12 in. wide.



**Bettendorf Flat Car with Steel Underframe.**

formations in the sheet of metal have, in themselves, the effect of stiffening the door and making it rigid. There is no overlapping of sheets.

Within the interior of the door, and along its edge, is a one-piece reinforcing frame, which further assists it to withstand abusive treatment and prevents distortion of the door in service.

These doors can be made in any design, or to any dimensions desired, and with such glass or panel design as may be preferred. Formed up from accurate dies, there can be no variation in the dimensions of the door; therefore there is an interchangeability of the doors for similar openings which cannot be obtained to the same degree in a built-up door.

The door is rendered rust proof, within and without, by a special steel preservative baked on the interior and exterior.

to the ends of which are secured the Bettendorf cast steel draft sills, arranged with the necessary stops, which are cast integral with the draft sills, to accommodate the Miner tandem draft gear. The needle beams are five in number and are from rolled I-beams 10 in. deep and weighing 25 lbs. per foot. These needle beams pass through the center sill at the openings provided for them, and in which they rest, bearing directly on the center sill and held in position by means of malleable iron gussets attached to either side of the web of the center sill.

The body bolsters are of cast steel, of special design, to accommodate this type of car, and are continuous, passing through an opening in the ends of the draft sills. The brake mast is so arranged that it can be located either at the end



**Bettendorf Gondola Car with Steel Underframe.**



or at the side of the car in case the lading would otherwise interfere with it. The sides and ends of the car are Oregon fir  $2\frac{1}{4}$  in. thick, with white oak stakes, and the flooring is yellow pine  $2\frac{3}{8}$  in. thick. The weight of the car as a gondola is only 32,200 lbs., and as a flat car it is but 26,800.

#### FAIRBANKS-MORSE STANDPIPE.

For many years Fairbanks-Morse & Company, Chicago, have been building water cranes and it is of interest to look back at the old "two-man" models and compare them to the modern crane with its improvements and perfections. Their No. 10 telescopic spout standpipe is their latest type, although it has been on the market three or four years. Large locomotives with high tenders, used on the same divisions with older type low-tender engines, call for a water crane with a vertical range. The No. 10 Fairbanks-Morse standpipe has a vertical range of five feet, enough to water the highest and lowest engine tanks without flooding the tracks. It is a one-man pipe which can



Fairbanks-Morse Standpipe No. 10.

be operated alone by the fireman on the engine. The main valve is the same as that used on other types of Fairbanks-Morse standpipes and has thoroughly demonstrated its merits under all conditions of service. This valve is water balanced, giving the same pressure on both sides of it when closed, so that there is little chance for leakage. An automatic relief valve is furnished which prevents water hammer, which is so destructive to pipe lines and tanks. The standpipe is securely locked parallel with the track, and can be unlocked and turned by the fireman on the tender. When an engine is watered, the pipe locks automatically when swung back from the tender.

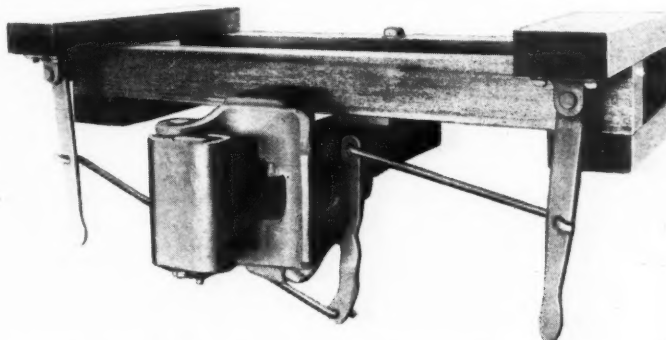
#### CAR RADIATORS.

The United States Radiator Corporation, Detroit, Mich., makes a special type of radiator designed for heating new styles of passenger coach. This radiator is installed at the side of the car close to the floor, and is so built that expansion is well cared for and there is no strain from the movement of the car on the tracks or around curves. Large orders for these special radiators have been received from the Pennsylvania Railroad for installation in cars that were built by the American Car & Foundry Company, New York. Samples of these radiators are on exhibition at the company's booth.

#### SIMPLEX COUPLERS.

The Simplex passenger coupler exhibited at the booth of the American Steel Foundries, Chicago, is made so it can be uncoupled from either side of the train, thus meeting the requirements of the new safety appliance law. The same arrangement can be applied to the ordinary type of Simplex passenger couplers which are already in service, with but slight alteration, making the device equally desirable for new work or repair purposes.

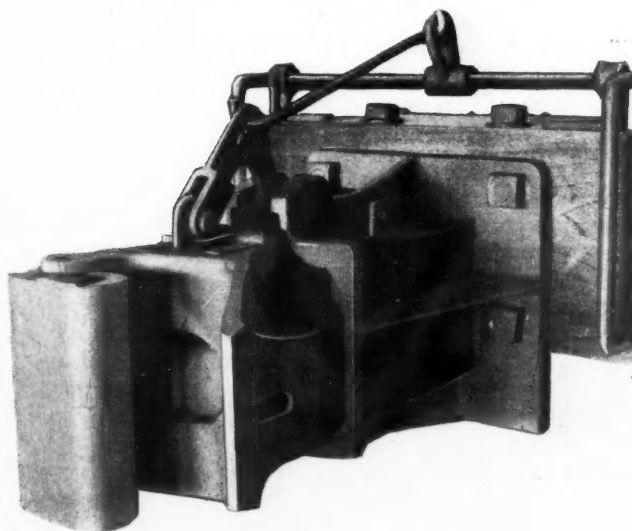
In addition to the passenger coupler, engine couplers of various types are shown with uncoupling arrangements as



Simplex Passenger Car Coupler, Arranged to Operate from Either Side.

recommended in the safety appliance law, and arranged for maintaining standard coupler heights, with the least amount of attention and expense. The usual types of top lift and side opening Simplex freight couplers are also exhibited. These couplers are made with a great variety of different sized shanks and ends to meet the needs of various kinds of service.

There are now about half a million Simplex couplers in use and to meet the constantly increasing demands for the coupler the American Steel Foundries is devoting the entire



Simplex Engine Coupler.

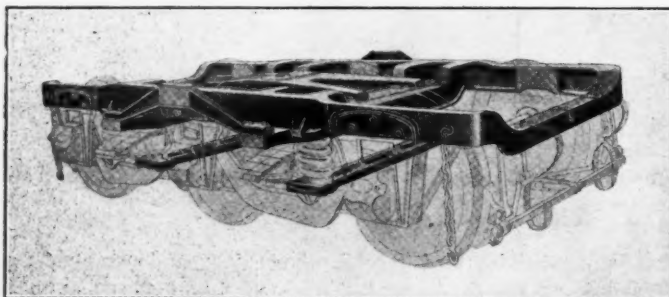
tonnage of its Alliance foundry to coupler work. Apparatus for conducting all of the tests provided for by the Master Car Builders' rules is maintained for the use and convenience of the representatives of the railways who have in charge the work of conducting tests. Simplex couplers are made of high grade open hearth cast steel, accurate physical and chemical analyses being taken of each heat.

The Simplex couplers embody the suggestions and recom-

mendations which have been made from time to time by the Master Car Builders' Association. Special attention is given to the interchangeability of parts, the locks and knuckles being ground accurately to gages, resulting in a smoothness of operation in the completed coupler. Special attention is given to the contour of the coupler head and knuckle tail in order to make them coincide accurately, and thus permit two engaging couplers to mate readily at slow speed. This feature with the wide opening provided by the knuckle makes a coupling positive regardless of the relative position of the couplers to each other, or the speed at which they come together. Simp'x couplers contain as few parts as possible, and have no small parts, making the coupler easily handled and maintained.

#### COMMONWEALTH PASSENGER TRUCK.

The six-wheel truck shown herewith is the product of the Commonwealth Steel Company, St. Louis, Mo. This truck

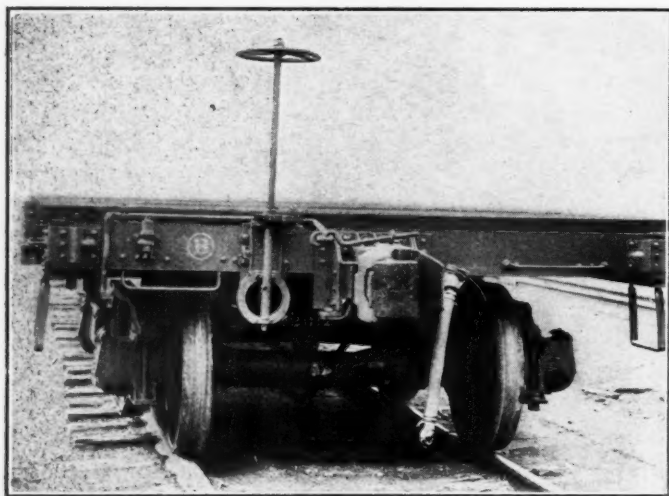


Commonwealth Six-Wheel Passenger Truck.

has been used in passenger service for many years, and the makers claim for it an efficiency due to the elimination of repairs, simplicity of construction and maintenance of alinement.

#### FEASIBLE DROP BRAKE STAFF.

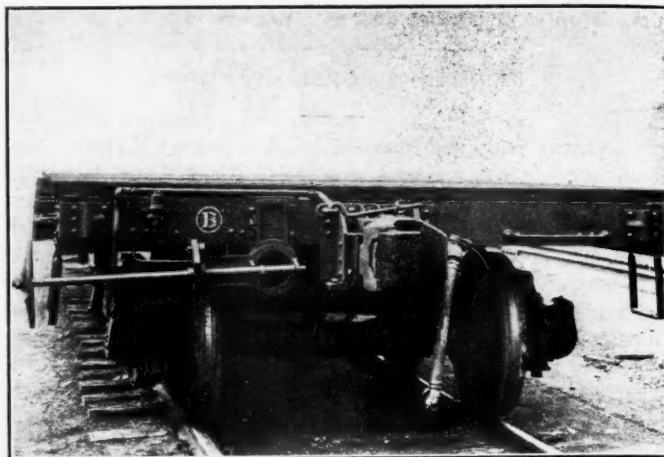
The new design of the Feasible brake staff, as made by the United States Metal & Manufacturing Company, New York, is shown in the accompanying illustrations. This



Feasible Drop Brake Staff in Vertical Position.

brake staff meets the rulings of the Interstate Commerce Commission. The necessary change on the cars to have them agree with these new requirements is to build out the coupler striking plate the proper distance to give the

necessary clearance between the edge of the brake wheel and the line through the face of the locked knuckle. During the past year about a thousand cars have been equipped

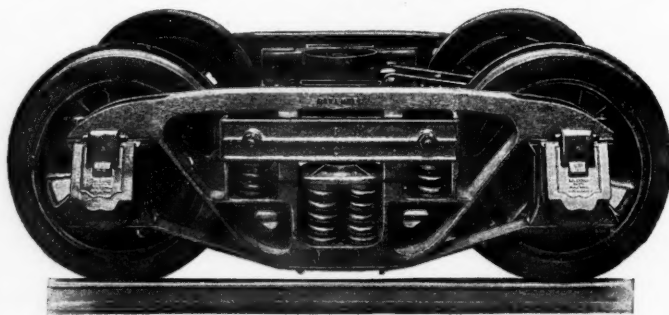


Feasible Drop Brake Staff in Horizontal Position.

with this brake staff; a sample of it is on exhibition at booth 337.

#### BUHOUP FLEXIBLE TRUCK.

The Buhoup flexible truck is exhibited by the McConway & Torley Company, Pittsburgh, Pa., in spaces 617, 619, 621. This truck embodies the desirable features of the cast steel side frame, which has passed the experimental stage, and has other distinctive features peculiarly its own. The truck consists of two cast steel side frames in combination with a cast steel bolster and will take any style or make of standard oil box as is used with the arch bar type of truck, with forged bottom tie bars. The brake hanger brackets are attached to the inside of the side frame. The truck is so constructed that the usual spring plank is not necessary. It is flexible to vertical movement, but rigid to any twisting or angular horizontal movement. This vertical flexibility allows



Flexible Truck.

the truck to adapt itself to the uneven conditions of track, high or low joints, with the wheels firmly on the rails, without any undue strains to any part of the truck.

The load is distributed over a large area instead of being concentrated in the middle of the side frames. The distribution of springs is such that an increased spring capacity may be secured, and this feature, with the large area of distribution of load, should insure an easy riding and long-lived truck. Several of these trucks have been in successful operation for some months past under tenders of locomotives in switching service. The side frame and bolster and other parts of the truck are made from acid open hearth steel, thoroughly annealed, and conforming to standard cast steel specifications.



# Railway Age Gazette

DAILY EDITION

Vol. 50. NEW YORK—JUNE 22, 1911—ATLANTIC CITY. No. 24f.

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE, BY  
THE RAILROAD GAZETTE (INC.), 83 FULTON ST., NEW YORK.CHICAGO: 417 South Dearborn St. CLEVELAND: New England Bldg.  
LONDON: Queen Anne's Chambers, Westminster.W. H. BOARDMAN, *Chairman of the Board.*E. A. SIMMONS, *President.*L. B. SHERMAN, *Vice-President.*HENRY LEE, *Sec'y & Treas.*

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Subscriptions, including 52 regular weekly issues and special daily editions  
published from time to time in New York, or in places other than New  
York, payable in advance and postage free:

United States and Mexico.....	\$5.00
Canada .....	8.00
Foreign Countries (excepting daily editions).....	8.00
Single Copies .....	15 cents each

Shop Edition and the eight M. M. and M. C. B. Convention Daily Issues,  
United States and Mexico, \$1.50; Canada, \$2.00; foreign, \$3.00.Engineering and Maintenance of Way Edition and the four Maintenance  
of Way Convention Daily issues, North America, \$1.00; foreign, \$2.00.Entered at the Post Office at New York, N. Y., as mail matter of the  
second class.

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## THE EXHIBIT: 1639

THE legal department is now pope of the railway business, and when the M. M. and M. C. B. Associations began to feel a fondness for each other that they thought might lead to matrimony, they naturally applied to it for a dispensation. Now that the legal department has said that they may marry their affections seem to be cooling. The committees on Consolidation of both associations were continued, but perhaps Mr. Schroyer expressed the view of most of their members when he said, as a member of the M. C. B. committee, that it probably would do nothing. The contemplation of matrimony is somewhat different from entering into it. The two associations have worked along similar lines and in close co-operation for years, and have secured good and enduring results. A consolidated body might do better; but it is far from certain that it would do equally well. At any rate, the prospects of consolidation in the near future look very slim.

IN the *Daily* of June 14 we commented on the failure to get some of the committee reports of the two associations to the members early enough to allow them to study and digest them before coming to the conventions. Investigation leads us to believe that this delay was largely due to the fact that many of the committee chairmen and members were compelled to give so much time to the question of safety appliances and federal boiler inspection during the year that they could not very well give much time to the committee work of the associations without seriously interfering with their other duties. It seems only fair that this explanation should be made; but it is greatly to be hoped that it will be possible to make a far better showing next year.

STEPS must be taken to provide a steady supply of recruits for carrying on the work of the car department. It is true that in the days of the light capacity wooden car this department did not offer the same attractions to the young man as the locomotive department, but to-day the building and repairing of high capacity freight and passenger cars to withstand the severe service in heavy and high speed trains requires a very different type of training and ability. To-day the car department offers an attractive field to the young man about to select his life work. Mr. Downing's motion that a committee be appointed to investigate the question of the development and training of car department apprentices is therefore a most important one. The committee will at least have some good sources to draw on for information as to how not to do it, and as to methods that are already giving good results. Mr. Downing at Collinwood, George Carson at West Albany and W. O. Thompson at East Buffalo have all been studying and working along the line of training young men in the work of the car department.

DONALD R. MACBAIN, the newly elected third vice-president of the Master Mechanics' Association, was born October 23, 1861, at Queenston Heights, Ont., Can. He was educated in the common schools and entered the service of the Canadian Southern, now a part of the Michigan Central, as a machinist apprentice October 9, 1876. Two years later he was made a locomotive fireman, remaining in that position until November, 1882, when he was promoted to engineer. In May, 1890, he was appointed a traveling engineer, and ten years later was promoted to the position of master mechanic, with headquarters at Michigan City, Indiana. A year later he was transferred to St. Thomas, Ont., and later to Jackson, Mich. He was appointed assistant superintendent motive power in July, 1906, and in April, 1908, was transferred to the same position on the New York Central & Hudson River, with headquarters at Albany, N. Y. In the spring of 1910 he was appointed superintendent motive power of the Lake Shore & Michigan, the Chicago, Indiana & Southern, and the Indiana Harbor Belt, which position he now holds. No greater tribute could be paid to Mr. MacBain than to quote the expression of one of his intimate friends, that "he is one of the most evenly balanced men I know." This rare combination of qualities marks him as big and broad gage, and, together with his extensive experience, fits him admirably for the important executive position he now holds on the Lake Shore. Like his predecessors on that road, he is greatly respected and liked by both his subordinates and those to whom he reports.

THE action taken by the Master Car Builders' Association yesterday morning to start an apprenticeship movement in the car shops, though a trifle belated, is one in the right direction and cannot fail to bear fruit. The ostensible reason for it was the rapid increase in the number of steel cars, and the necessity of having men skilled in the art of car building to make repairs and do other work in connection

with them. For years the car repairer has "just growed;" he has had little instruction as to the reasons for practices that have existed time out of mind, and his sole dependence has been upon his own observation and experience. A veteran car builder tells the story of his own experience, that, as an apprentice, he was set to work in the "bone" yard and kept there for months. Tiring of the dirty, unsatisfactory work, he asked to be transferred to the building shop. The master car builder of the day told him to go back to the bone yard and keep his eyes open, because that was the way to learn. He was advised to observe how and where cars failed; where they were strong and where they were weak. He says he followed the advice and there learned more of car building than he had thought possible before. It was the old-time way. The boy could learn what he could pick up, and he developed into a master car builder or a wood butcher according to his ability. But the new wine of present day vintage needs new bottles, and the old system of hit-and-miss car shop apprenticeship must be regarded as a thing of the past, and modern ways take its place. Certainly it will be a profitable field to cultivate.

THE strong point of M. K. Barnum, who was yesterday elected third vice-president of the Master Car Builders' Association, is diplomacy—diplomacy not of the wishy-washy sort, but of the very highest type. For instance, when he was appointed general inspector of machinery and equipment of the Chicago, Burlington & Quincy, reporting directly to the vice-president, he accomplished remarkable results, and yet at no time was there the slightest friction with any member of the mechanical department. Cases are not uncommon of men who have occupied similar positions who have stirred up a lot of trouble and have accomplished very little as far as net results are concerned. When W. L. Park, vice-president and general manager of the Illinois Central, was looking for a strong and capable man to head the mechanical department of that road he selected Mr. Barnum because he understood him thoroughly and knew exactly what his capabilities were. Mr. Barnum had been closely associated with him on the Union Pacific in both a business and a personal way. Mr. Barnum was born April 6, 1861. He was graduated from Syracuse University in 1884 with the degree of bachelor of arts, and later had the degree of master of arts conferred upon him. He entered the service of the New York, Lake Erie & Western, now the Erie, at Susquehanna, Pa., as a special apprentice. He was a machinist, mechanical inspector and general foreman of the same road at Salamanca, N. Y.; also general foreman of the Louisville & Nashville shops at New Decatur, Ala.; assistant master mechanic of the Atchison, Topeka & Santa Fe at Argentine Kan.; superintendent of the Union Pacific shops at Cheyenne, Wyo., and later district foreman of the same road at North Platte, Neb., and division master mechanic at Omaha. He was then appointed assistant mechanical superintendent of the Southern Railway, and in February, 1903, was appointed superintendent of motive power of the Chicago, Rock Island & Pacific. In April, 1904, he was made mechanical expert of the Chicago, Burlington & Quincy, and in 1907 was made general inspector of machinery and equipment of that road, reporting directly to the vice-president. In the spring of 1910 he was appointed general superintendent motive power of the Illinois Central, the Indianapolis Southern and the Yazoo & Mississippi Valley.

TWO of the most successful railway mechanical department conventions ever held have drawn to a close, and the members are hurrying back home to take up their duties with renewed energy and inspiration. It would be interesting if we could accurately gage the after results upon the attendants of each of three important factors—the discussions in the convention hall, the inspection value of the exhibits, and the information gained in the informal confer-

ences of the members at the hotels and on the pier. Many railway mechanical men are so busy with details on their own roads that they can not travel much and see what those on other roads are doing. In other words, there is a possibility of getting into a rut. Taking part in the discussions at the conventions and following them closely is a splendid way of making a member realize that he has much to learn; the effect is very broadening. The educational value of the exhibits is far-reaching. Here may be seen the very latest new devices, or improvements on old devices. In many cases the apparatus is shown exactly as it is applied or is in actual operation. Not the least important good which may be derived from the convention comes from the informal chats among the members. Each one has some problems or difficulties which have been solved or overcome by his fellows, and often a few minutes' talk may be the means of solving a problem which it would have taken months to solve otherwise. The number of roads whose higher officers are insisting that the mechanical department officers, including the foreman, should avail themselves of these opportunities in Atlantic City, is growing, and all records are being broken in the number of railway men in attendance.

#### PRESIDENT STEWART

NO mention is made in the constitution of the Master Car Builders' Association of any requirements concerning the birthplaces of candidates for the presidency of that association. Nevertheless, Illinois seems to be the favored district. Alexander Stewart, the newly-elected president, was born in Springfield, Ill., in 1868 and spent his early school days there. Theodore Curtis, the retiring president, was born in Terre Haute, Ind., in 1866, and that city is just on the line between Indiana and Illinois. Frank H. Clark, who preceded Mr. Curtis as president, was born at Pecatonica, Ill., in 1865.

Mr. Stewart entered the service of the Union Pacific as a machinist apprentice. After serving his apprenticeship, he worked as a machinist, machine foreman, general foreman, general division foreman and master mechanic, leaving the service of the Union Pacific in 1903 to accept a position as division master mechanic with the Southern Railway at Knoxville, Tenn. Four months later he was promoted to general master mechanic of the Western district of that road. On the resignation of Samuel Higgins, April 1, 1904, Mr. Stewart was appointed mechanical superintendent, and two years later, April, 1906, he was made general superintendent motive power and equipment.

Mr. Stewart is noted for his executive ability, and his success as an organizer has enabled him to handle the mechanical department of the Southern Railway, which is scattered over an exceptionally large territory, with practically no friction and on an economical basis. His delightful personality has made him a host of friends. He is always ready to grant an audience to those who may wish to see him on business matters, and is uniformly considerate of the feelings of others. He will make a strong running mate with Mr. Bentley, the newly elected president of the Master Mechanics' Association. The *Railway Age Gazette* congratulates the association on making such a good selection, and Mr. Stewart on the honor which has been conferred upon him.

The report of the Sao Paulo Railway Co. for the half-year ending December 31, 1910, fixes the receipts at \$6,091,785, and operating expenses at \$3,055,300, leaving a net revenue of \$3,036,485, as against \$3,715,385 in 1909. The directors declared a dividend of 2½ per cent. on the preferred stock (at the rate of 5 per cent. per annum) and on the common stock a dividend of 5 per cent. (at the rate of 10 per cent. per annum), together with a bonus of 1 per cent. During the last ten years the dividend of this company has never been less than 12 per cent. per annum.



## Proceedings.

President Curtis called the third and final session of the Master Car Builders' Association to order at 9:35 Wednesday morning.

Ballots were distributed for the election of officers. D. F. Crawford and C. E. Fuller withdrew their names from the ballot for the election of president.

### CONSOLIDATION.

F. H. Clark (chairman of committee):—At the meeting last year the committee on consolidation presented rather a long report, and about the only thing that they did not cover in that report was the question of the legality of the proposed consolidation. The committee was continued at that time and instructed by the executive committee to look into the question

so. If we do want consolidation, why then let us say that we do.

(The question was called for and the motion carried.)

Mr. Wildin:—I rise for information, Mr. President. Now that this committee has been continued I would like to ask what it is going to do?

C. A. Schroyer (C. & N. W.):—As a member of the committee I would advise the gentleman that we are not going to do anything (laughter).

Mr. Wildin:—I move that the committee be instructed to present a plan for consolidation at the next convention.

(The motion was lost.)

(Vice-president Stewart took the chair.)

### REVISION OF RULES OF INTERCHANGE.

The railway clubs and members have submitted their proposed changes in the rules and these have been considered, and the recommendations of your committee are submitted herewith:



Donald R. MacBain.

*New Third Vice-President, M. M. Association.*

of the legality of the proposal and to report at this meeting. We have not prepared a written report, but we simply report that we are advised that there is no legal objection to the consolidation of the two associations.

C. A. Seley (C. R. I. & P.):—I move that the report of the committee be received and the committee continued.

(The motion was seconded.)

G. W. Wildin (N. Y. N. H. & H.):—I think it is about time that we got down to something definite in this matter. I think every member here ought to express himself one way or the other on this question. Now, as the representative of the New Haven road I want to cast the vote of that road for consolidation, and I would like to hear from other members of the association here along that same line. I think we have dilly dallied on this matter long enough. Now, so long as there is no legal objection to the consolidation, let us vote on it one way or the other. If we do not want consolidation, let us say

*Rule 2.*—The committee suggests the following modification of the first paragraph of this rule: "No car having defects constituting a violation of the law should be offered in interchange. Cars, if defective, under M. C. B. Rules, must be properly carded when offered in interchange. Empty cars offered in interchange must be accepted if in safe and serviceable condition, the receiving road to be the judge in cases not provided for in Rules 32 to 38, inclusive.

"Loaded cars offered in interchange must be accepted, except that receiving line may reject cars not loaded in accordance with the Rules for Loading Materials, A. R. A. Car Service Rule 15 to apply (see page —) when transfer or rearrangement of load is necessary.

"When it becomes necessary to transfer a load, such car, when empty, may be returned to the delivering line, in which case all defects objected to must be designated on a return card of form shown on page 77, filled in with ink or black

indelible pencil and placed on car adjacent to the destination card.

"Balance of rule to remain as at present."

**Rule 3.**—The committee recommends that the rule be changed to read:

"If a car has defects for which the owners are not responsible, the receiving line shall require that a defect card be securely attached to the car, as per Rule 14."

**Rule 4.**—The Vandalia R. R. Co., the St. Louis Railway Club, and the Railway Club of Pittsburgh suggest in Rule 4, add new paragraph, viz.:

"Defect cards shall not be required for any damage that is so slight that no repairs are necessary."

The suggestion is approved, but the committee would recommend that it be made a new paragraph under Rule 3.

**Rule 5.**—It is suggested that the word "cardboard" be added after the word "be" in the first line.

The above suggestion meets with the approval of the committee.

**Rule 9.**—The committee approves the following revision of this rule to show necessary information in tabulated form:

	New or secondhand.
	Make or name of coupler.
	Steel or malleable.
	Size of shank.
	Size of butt.
"M. C. B. couplers or parts thereof applied and removed.	Complete, or name of part or parts.
	Open or closed knuckle.
	Yoke or stem attachment.
	Part or parts scrapped.
	Cast or solid steel.
	New or secondhand.
	Box numbers (see Rule 14).
"Wheels and axles R. & R.	Cause of removal and reference to M. C. B. rule under which all defective wheels are removed.
	Solid, filled or other kind.
"Journal bearings R. & R.	Length of bearings.
	Box number (see Rule 14).
	Make, or name of beam.
	New or secondhand.
"Metal brake beams or parts thereof R. & R.	Complete, or part or parts.
	Cause of removal.
	Part or parts scrapped.
"Brake shoes R. & R.	Cast or reinforced.
"Kind of triple valve removed and applied."	

Last paragraph of Rule 9 relative to removal of load in order to make repairs, to remain as at present.

The committee approves the following suggestions: Fourth paragraph, change word "open" to "slotted" and word "closed" to "solid." Add the following: "When triple valve or cylinder is cleaned, the initial of road and date of last cleaning must be shown."

**Rule 12.**—The committee would recommend that the rule be changed to read:

"The evidence of a joint inspector or the joint evidence of two inspectors, one representing the owner of the car and the other representing a railroad company, that the repairs are not proper, shall be final: the evidence to be signed only after an actual inspection has been made." Remainder of rule to remain as at present.

**Rule 17.**—The committee approves the suggestion to add to end of last paragraph: "Fir or oak may be substituted for pine when splicing longitudinal sills."

**Rule 18.**—The committee suggests eliminating "Except on cars offered in interchange" from third paragraph and refers the suggestion regarding the standardization of coupler with 8½-in. butt end to the committee on couplers and draft attachments.

**Rule 20.**—The committee approves the suggestion of adding the words "measuring 31½ in. or less" after "loaded car" in the tenth line. Also the suggestion that a period be placed after the word "thereof" in the ninth line, beginning therefrom a new sentence reading: "A loaded car measuring 31½ in. or less should be adjusted to 33½ in., or within a ¼ in. thereof . . ." following with the balance of the rule after eliminating the phrase "and when it is necessary to alter a loaded car it should be adjusted to 33½ in., or within a ¼ in. thereof."

**Rule 21.**—The committee does not approve the suggestion that the following should be embodied in this rule: "Charg-

ing car owners for any temporary repairs made to get cars home when necessary on account of owner's responsibility."

**Rule 22.**—The committee recommends that the rule be changed as follows:

"Draft timbers must not be spliced. Longitudinal sills may be spliced at both ends, except that not more than two adjacent sills may be spliced at same end of car. The splicing of any sill between cross-tie timbers will not be allowed."

"The splice may be located either side of body bolster, but the nearest point of any splice must not be within 12 in. of same, excepting center sills, which must be spliced between body bolster and cross-tie timber, but not within 24 in. of body bolster."

"In splicing longitudinal sills other than center sills, if same are less than 12 in. in depth, the plan shown in either Fig. 8 or 9-B shall be followed. If the sills are 12 in. or more in depth, the plan shown in either Fig. 9 or 9-B shall be followed. In splicing center sills the plan shown in Fig. 9-B shall be followed."

"Sills of foreign cars shall be spliced as above provided. "Cars delivered in interchange with center sills spliced in accordance with Fig. 9-A will be accepted."

"(Last paragraph to remain as at present.)"

"(Figs. 8, 9, 9-A and 9-B should be relocated and shown together. Figs. A, B and C to remain as at present.)"



J. J. Hennessey.

Chairman, Committee on Arbitration.

**Rule 24.**—The committee recommends that the second paragraph of this rule be changed to read:

"In no case should two new wheels be mounted on the same axle when the thickness of the two flanges together will exceed the thickness of one normal and one maximum flange, or 2½ in."

**Rule 30.**—The committee proposes the following:

That the first paragraph of this rule, covering the weighing and restenciling of cars, be eliminated, and that Rule 11, of the code of car-service rules adopted by the American Railway Association, be substituted therefor, as follows:

(a) The date (month and year), also weight and capacity, should be stenciled on each new car as it comes from the car works, under the supervision of the owner's inspector. The scales used for this purpose should be tested by the railroad company's inspector, provision to this effect to be incorporated in the contract covering purchase of the equipment.

(b) Wooden cars one year old should be reweighed and restenciled, the weight to be followed by one star; cars two years old should be again weighed and stenciled, the weight to be followed by two stars; cars three or more years old should be again weighed and stenciled, the weight to be followed by three stars, which will indicate final weight.

(c) Steel cars should be reweighed and restenciled after they have been in service twelve months, the weight to be followed by three stars, indicating final weight.

(d) If cars are materially changed by reason of new appliances or otherwise, they should be reweighed and restenciled without change in the number of stars.

(e) Unless the owner instructs otherwise, any car without stenciling, or with a variation of 500 lbs., should be imme-



diately reweighed and restenciled and car owner notified of old and new weights. The Official Railway Equipment Register will designate the proper officer to whom these special reports should be made.

(f) The date (month and year) of each reweighing should be stenciled the same as provided for new cars in paragraph (a). Cars must be cleaned before reweighing.

**Rule 32.**—The committee approves adding new paragraph as follows:

"Defect cards shall not be required for any damage so slight that no repairs are necessary, the receiving line to be the judge."

**Rule 33.**—The committee would recommend that the rule be changed to read:

"Material missing from bodies of cars offered in interchange, except grain doors, water troughs and attachments, nuts, body truss-rod saddles on bolsters, roof boards, ventilated side and end doors unless car is so stenciled, wooden door caps, side and end fascia and all inside or concealed parts of cars."

of all-steel underframe cars, when necessary to repair, if caused by unfair usage (delivering company responsible). When repairs exceed the combinations as covered by Rules 37 to 43, inclusive, owners' authority must be obtained before repairs are made. Longitudinal sills, end sills and other steel parts of cars which become defective due to corrosion and which were not damaged in accident or by unfair usage (owners responsible)."

**Rule 44.**—The committee would recommend the following addition:

"The transfer or readjustment of lading as prescribed in A. R. A. Rule 15, see page — (delivering company responsible)."

**Rule 53.**—The addition of two new paragraphs is suggested as follows: "After September 1, 1912, all freight cars offered in interchange not equipped with pressure-retaining valve (delivering company responsible)."

"After September 1, 1912, no cars will be accepted in interchange unless equipped with M. C. B. quick, action triple."

The committee approves of the suggestion regarding pressure-



Morgan K. Barnum.

*New Third Vice-President, M. C. B. Association.*

**Rule 37.**—The committee approves of the suggestion regarding the change in the heading of the rule which should read:

"Combination of damages to cars with wood underframe or composite wood and metal underframes which denote unfair usage, if existing at same end of car." Also the change of word 'or' in the third line to 'and.'

**Rule 40.**—The committee would recommend a new rule as follows:

"Damaged end sill, accompanied by damage to draft timber (or its substitute) or longitudinal sill, and damage to either coupler body or pocket."

**Rule 43.**—The committee approves the suggestion that the rule be changed to read: "Damaged corner and end posts, if necessitating the renewal of more than two posts."

Also suggests a new paragraph, reading: "This will include damage to upper structure of cars with metal underframes."

A new heading to cover steel cars should be added as follows:

"ALL STEEL OR ALL STEEL UNDERFRAME CARS."

A new rule relating to steel cars is recommended as follows: "Damage to bodies of all steel cars, or damage to underframe

retaining valves and would approve the suggestion relating to quick-action triple valves with the modification that the words 'standard 1¼-in. train line, angle cocks and' be omitted.

**Rule 57.**—The committee approves adding after the words "triple valves" the words, "brake pipe air strainer or dirt collector."

**Rule 58.**—The committee suggests that the cut illustrating the label be changed so as to show the name of the road or purchaser.

**Rule 59.**—The committee would approve of the suggestion that the words "rust or" be added after the words "account of" in second line.

**Rule 60.**—The committee approves the suggestions that the word "marked" in the fourth line be changed to read "stenciled." The additions after the word "the" in third line, "Initial of road together with:" and at end of rule, "Triple valves cleaned should be tested on an M. C. B. test rack."

**Rule 64.**—The committee would suggest that rule be changed to read:

"Material missing from trucks of cars offered in interchange except journal-box lids and nuts."

**Rule 66.**—The committee approves the addition to this rule reading:

"After September 1, 1915, cars equipped with wooden or trussed wooden brake beams will not be accepted in interchange."

#### WHEELS.

**Rule 70.**—The committee approves change of rule to read:  
"Cars equipped with forged steel or steel-tired wheels and so stenciled, if found with cast-iron or cast-steel wheels."

"Forged steel or steel-tired wheels may be substituted for cast-steel wheels."

And the following addition: "Cars equipped with cast-steel wheels and so stenciled, if found with cast-iron wheels."

**Rule 75.**—The committee approves the omission of the following words:

"Flange over  $1\frac{1}{16}$  in. thick for cast-iron wheels, standards of 1903, 1904, 1905 and 1906 (see Fig. 6), or."

**Rule 76.**—The Central Railway Club recommends that the matter of devising a gauge and determining the depth that a wheel tread can be worn before necessary to remove be referred to the Wheel Committee for the adoption of a gage and limit.

The committee suggests that this matter be referred to the car wheel committee.

**Rule 83.**—Mr. W. A. Nettleton suggests an M. C. B. standard gage or method for measuring the thickness of service metal of rolled-steel or steel-tired wheels.

The committee approves the suggestion changing the rule, omitting Fig. 6 and changing Fig. 9 from 4 ft.  $5\frac{1}{2}$  in. to 4 ft.  $5\frac{3}{4}$  in. The suggestion of Mr. Nettleton is referred to the wheel committee.

**Rule 85.**—Add after the words "worn out" in second line, "the length of journal increased  $\frac{1}{2}$  in. over standard length."

This suggestion meets with the approval of your committee.

**Rule 86.**—The wheel-seat 5-inch journal, Table I, given as  $6\frac{1}{4}$  in. should be  $6\frac{3}{4}$  inches. This is a typographical error and should be corrected.

#### IMPROPER REPAIRS.

**Rule 91.**—The suggestion of elimination of this rule meets with the approval of the committee.

**Rule 92.**—The suggestion of the elimination of this rule is approved by the committee.

**Rule 96.**—The committee approves that this rule be eliminated.

**Rule 101.**—The committee would recommend to the executive committee the appointment of a committee on uniform second-hand and scrap pieces for wheels or the reference to the car wheel committee of such suggested changes in this rule as relate to prices for wheels. The price for new 33-in. cast-iron wheel, new, \$9.50, is wrong; it should be \$9.00. This is a typographical error and will be corrected.

**Rule 103.**—The second paragraph of this rule should be omitted, as it is covered by Rule 10.

**Rule 104.**—It is suggested for this rule—Air-brake Material: Prices for release valve handle for 8-in. equipment should be changed to 10 cents, instead of 8 cents, or the same as for 10-in. equipment, as they are identical.

Second item, page 51, reading  $\frac{3}{4}$  in., should read pipe,  $\frac{3}{8}$  in., per foot.

Add the following items:

	8-inch.	10-inch.
Release valve rubber seat.....	\$0.02	\$0.02
Release valve vent valve complete.....	.10	.10
Air-hose coupling-guard pin.....	.10	.10

Omit item:

Triple cylinder bushing renewed.....	\$1.12	\$1.12
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This item was recommended to the arbitration committee last year as "Triple cylinder bushing reground or refitted" and should be properly placed under Rule No. 115, as Rule 104 covers only material charges.

Change price of "triple check-valve case" to 1.00 1.00.

Material: Prices for coupler parts should be adjusted so that the same compare more closely with the cost, also that the details will correspond with the prices for complete couplers which will simplify the billing transactions. At the present time the detail credits for secondhand parts of couplers removed exceed the total value of complete secondhand coupler applied. Proposed change as follows:

Coupler body, one, new steel, 5 by 5 in. shank.....	\$5.75	instead of \$5.50
Coupler body, one, new steel, 5 by 7 in. shank.....	6.50	instead of 7.75
Coupler knuckle, one, new, solid..	2.25	instead of 2.00
Coupler lock, one, new.....	.50	instead of .40

No changes in scrap credits.

The committee approves of the suggestions covering prices for air-brake materials and coupler parts.

The recommendation increasing the price of mineral paint, is

approved, but your committee would suggest 6 cents per pound instead of 8 cents. The second item, page 51, viz.; pipe, should read  $\frac{3}{8}$ -inch per foot instead of  $\frac{3}{4}$ -inch. This is a typographical error and should be corrected.

The committee would recommend that the price for applying handhold, one, applied, net, be increased from 25 cents to 40 cents.

**Rule 108.**—The committee recommends that a new paragraph be added as follows:

"In the case of defective couplers, when another make is applied, credits shall be confined to the body, lock, knuckle and knuckle pin."

**Rule 111.**—The committee would suggest that the charges for weighing and restenciling cars be increased as follows:

Stock cars, net.....	\$1.00
Other cars, net.....	.75

On page 57, the thirteenth line from the bottom, should read \$14.64, instead of \$16.64. This is a typographical error and should be corrected.

**Rule 113.**—The committee suggests changing length of carrier iron from four to six inches is approved by your committee.

**Rule 114.**—It is suggested adding paragraph as follows: "Applying brake hangers when brake beam is applied," and to second paragraph: "Also side siding when side sill or side plate is removed or replaced," and new paragraph to be added:

"Applying side sheathing where side sill or side plate under sheathing is renewed or replaced."

Your committee approves the above suggestions.

**Rule 115.**—The committee approves the following changes:

Cut-out cock, grinding in., R. & R.....	\$0.30
Triple cylinder bushing reground or refitted...	1.12
Triple-piston packing ring, fitted.....	.22
Dirt collectors in branch pipe, cleaned, drained and stenciled .....	.05

The item reading "Retaining valve repaired, 35 cents, is wrong; it should be:

Retaining valve repaired.....	\$0.25
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#### DETAILS.

Retaining-valve handle, R. & R.....	\$0.02
Retaining-valve case, R. & R.....	.01
Retaining-valve, ground in.....	.05
Retaining-valve cock key, ground in.....	.15
Retaining-valve cock key and spring, R. & R..	.02

\$0.25

**Rule 119.**—Exceptions have been offered as follows: "Except in case of trucks of 50,000-pound capacity or less, when railroad destroying the car may elect to retain trucks and settle for them (with the exception of the wheels) at scrap or secondhand value, in accordance with M. C. B. Rules, except those belonging to cars of individual ownership."

This suggestion is approved by the committee.

**Rule 120.**—The committee approves of the following changes and additions:

#### TRUCKS.

**First Item:**

50,000 lbs. capacity and less, with metal transoms and wooden bolsters, per pair.....\$215.00

**Second Item:**

70,000 lbs. capacity, but under 80,000 lbs., with wooden bolster, per pair..... 215.00

**New Item:**

50,000 lbs. capacity, all metal trucks, per pair..... 225.00

#### BODIES.

**New Item:**

Gondola, all-metal, twin-drop bottom, 40 tons capacity, but less than 50 tons capacity, 36 feet but under 40 feet..... 790.00

First item under steel cars (bodies) third line, add the word "over" between the words "over" and "end sills." Add the word "body" before the words "metal bolsters" in eighth line top of page 70.

The committee suggests changing the recommendation of the Western Ry. Club from \$60 to \$40.

**Rule 124.**—The adoption of some plan or provision is recommended to compel furnishing of shortest route home for movement of cars under this rule, that such cars may be delivered at the nearest home point on owning line, rather than furnish the original routing of the car and allow it to be billed accordingly.

The committee can not at this time approve these sugges-



tions, but would suggest that the executive committee communicate with the American Railway Association to ascertain whether such a provision in the rules of interchange is desirable.

#### FURNISHING MATERIAL.

**Rule 126.**—Regarding the question of furnishing materials on requisition for repairs to cars while on foreign lines, the committee would suggest that the matter be referred to the Executive Committee with the view obtaining an opinion from the Interstate Commerce Commission as to the responsibility for freight charges on such shipments.

#### APPENDIX.

**Rule 1.**—In the third line omit the word "and" and after the word "inspection" and add "and adjusting brakes."

**Rule 3 (a), 3 (b), 3 (c).**—Rule to read:

"Line expenses shall consist of the expense of terminal cleaning, icing, lubrication (oil, waste, tallow and labor).

"Oil lighting (oil, chimneys, wicks, burners, shades).

"Gas lighting (gas, mantles, tips, domes, globes, bulbs, bowls).

"Electric lighting (fuses, incandescent bulbs, charging currents).

"Heating (terminal heating and coal furnished for individual car heaters en route) candles and broken glass." These suggestions meet with the approval of the committee.

**Rule 12 (a), 12 (b).**—The following changes are suggested and approved: "On electrically lighted cars, furnished to foreign roads, where no agreement is made, the following charge shall be made per day for use of batteries:

	Depreciation	Current	Total
32 cells .....	46 cents	29 cents	75 cents
16 cells .....	23 cents	14 cents	37 cents"

Change last paragraph to read:

"On electrically lighted cars a charge of \$3 per 1,000 miles, with a maximum charge per car per month of \$30 shall be made to cover rental of the electric lighting apparatus and depreciation of batteries."

Referred to the committee on train lighting.

#### WHEELS—CAST-IRON.

**Rule 14 (a), 14 (b), 14 (c), 14 (d), 14 (e), 14 (f).**—This rule be changed to read:

"Worn flanges: flanges having flat vertical surfaces extending more than  $\frac{3}{8}$ -in. from tread, or, flanges 1 in. thick or less, gauged at a point  $\frac{3}{8}$  in. above tread," and that Rule 14-c to read:

"On flange 1 in. thick or less, flange having flat vertical surface  $\frac{3}{8}$ -in. or more." Fig. 4-a—reference to this figure should be omitted.

These suggestions are approved by the committee.

#### WHEELS—STEEL-TIRED.

**Rule 15 (a), 15 (b), 15 (c).**—Rule 15-b should be changed to read:

"Worn flange or tire; with flange  $\frac{15}{16}$  in. thick or less, or having flat vertical spot extending more than 1 in. from tread, or with tire thinner than shown in Figs. 1, 2, 3 and 4."

This is approved by the committee.

**Rule 21.**—The committee would suggest that rule be changed to read:

Air hose applied must be made in accordance with specifications for M. C. B. standard  $1\frac{3}{8}$ -in. hose and so labeled.

#### PRICES FOR MAINTENANCE OF PASSENGER CARS.

The committee recommends the following:

Item 14. Change to \$1.75. Item 15. Change to \$1.00. Item 16. Change to \$0.70. Item 17. Omit reference to mail cars and add it to Item No 15.

#### New Items:

Bowls, gas, at cost. Globes, gas, at cost. Bulbs, gas, at cost.

Item 22. Change to read: Electric lighting material incandescent bulbs, fuses, etc., at cost.

Gas-lighting materials, mantles, tips, bulbs, globes, domes, bowls, etc., at cost. Electric current, illuminating oil and Pintsch gas to remain separate items. Rearrangement of price-list in alphabetical order and separate columns for new secondhand and scrap prices.

Item 19. Change note to read: (No additional charge for cleaning trucks.) Item 21. Change to read: Brake shoes, Diamond S or steel back, applied, each, no credit for scrap, \$0.50.

#### New Item:

Hose,  $1\frac{3}{8}$ -in., steam, new, complete with fittings....\$6.50  
Item 58. Change to read: Wheels, solid steel or steel-tired, new or re-tired, cost.

Add footnote to list of prices as follows:

Cost price to be charged for material not in list above.

JOS. W. TAYLOR,  
Secretary.

The Arbitration Committee as a result of a meeting Tuesday afternoon modified one or two of its recommendations, as follows:

**Rule 2.** Change the second suggestion in the rule to read: "Cars having defects for which delivering company is responsible must be properly carded when offered in interchange."

Add paragraph as follows: "Owners must receive their own cars when offered home, subject to the provisions of these rules."

Change paragraph concerning loaded cars in interchange to read: "Loaded cars offered in interchange must be accepted except that the receiving line may reject leaking tank cars and cars not loaded in accordance with the rules for loading materials, A. R. A. Car Service Rule 15 to apply when transfer or rearrangement of load is necessary."

Change the last paragraph to read: "When it becomes necessary to transfer load, such car, when empty, may be returned to the delivering line. In case cars are rejected by the receiving road and returned to the delivering company, all of the defects objected to must be designated on a return card of the form shown on page 77, filled in with ink or black indelible pencil and placed on the car adjacent to the designation card." (Under M. C. B. couplers for parts thereof, etc.)

**Rule 104.** The committee would change the first paragraph of its decision to read as follows: The committee approves of the suggestion covering prices for air brake materials and coupler parts as outlined in the first recommendation, except the item for air hose coupling guard pin."

**Rule 52.** The committee would recommend the following additional paragraph. "Lag screws must not be used on cars stenciled United States Safety Appliances, Standard, or on cars stenciled United States Safety Appliances."

The report of the arbitration committee, as amended, was accepted and adopted.

#### SPRINGS FOR FREIGHT CAR TRUCKS.

The Secretary: I have the following report of the committee on springs for freight car trucks: The committee has not succeeded in getting together sufficient information to cover the subject properly, and respectfully asks for more time. (Signed) F. M. Gilbert, chairman.

The report of the committee was accepted and the committee was given further time.

#### LUMBER SPECIFICATIONS.

The Secretary: The Secretary has not received a report from this committee. Talking with Mr. Dow, the chairman, yesterday he said, as he understood it, the specifications prepared last year were satisfactory and are being adopted all over the country by the various lumber concerns and others interested in the work of the committee.

The committee on lumber specifications was afterwards discharged.

#### PRICES FOR LABOR AND MATERIAL FOR STEEL CARS.

The committee does not think it advisable to make any radical changes in prices for repairs to individual parts at this time, as it is impracticable to designate the extent of damage to the individual part on the various classes of cars, and establish a stipulated amount to make necessary repairs, for the reason that there are various parts of cars slightly damaged, which do not interfere with the safety for service or impair the strength of the car. Where it is found necessary to make extensive repairs, the rules as now recommended should be changed to the rivet basis; hourly labor charges and material prices will cover all requirements in making necessary repairs to this class of equipment for the present. In considering this subject, it was found that the parts of steel cars not included on the rivet basis are already covered by the present rules established for repairs to wooden-car equipment and which will govern.

The recommendations of the committee are as follows:

Eliminate all present rules on page 58 of the 1910 Code of Rules, with reference to repairs to steel cars, and substitute the following: All rivets  $\frac{1}{2}$ -in. diameter or over, 12 cents net per rivet, which covers removal and replacing of rivets, including removing, fitting, punching or drilling holes when applying patches or splicing and replacing damaged parts, not to include straightening. All rivets  $\frac{1}{4}$ -in. diameter and less than  $\frac{1}{2}$ -in. diameter, 7 cents net per rivet, which covers removal and replacing of rivets, including removing, fitting, punching or drilling holes when applying patches or splices and replacing damaged parts, not to include straightening.

Straightening or repairing parts removed from damaged car, 60 cents per 100 lbs. Straightening or repairing parts in place on damaged car; also any part that requires straight-



F. H. Clark.

Chairman, Committee on Prices for  
Labor and Material for Steel  
Cars.

ening, repairing or renewing, not included on rivet basis, 24 cents per hour.

Paragraph showing steel-scrap credits to be eliminated from Rule 111, on page 58; also Rule 107, on page 51, to be eliminated, and charges and scrap credits shown in Rule 104, on page 51, change to read as follows:

	Charge.	Credit.
Steel, plate and structural, per pound....	.03	.00 $\frac{1}{2}$
Steel, pressed and flanged, per pound....	.04 $\frac{1}{2}$	.00 $\frac{1}{2}$

In making repairs to cars on a rivet basis, the cost of removing and replacing fixtures not secured by rivets, but necessarily removed in order to repair or renew adjacent defective parts, should be in addition to the rivet basis; rules covering wood-car repairs to govern. Paint applied, one-quarter-hour labor to be allowed per pound of paint applied and on the basis of Rule 105.

The report is signed by F. H. Clark (C. B. & Q.), chairman; G. E. Carson (N. Y. C. & H. R.), C. F. Thiele (P. C. C. & St. L.), Ira Everett (L. V.), B. Julien (U. P.), S. T. Park (C. & E. I.) and T. M. Ramsdell (C. & O.).

The report was approved and the recommendations of the committee were referred to letter ballot.

#### TRAIN LIGHTING.

The committee sent out a circular of inquiry asking for recommendations as to any changes, additions or corrections in the recommended practice on train lighting and any other points which the members desired the committee to take action on. It received quite a number of replies to this inquiry and changed its suggestions as to recommended practices given in the report of 1910 to read as follows:

1. That each electrically lighted car be provided with a notice giving the following information that this notice shall be posted in the electric locker.

Type of Generator.  
Type of Regulator.  
Type of Lamps.  
Voltage of System.  
Voltage of Lamps.

Number of cells of storage battery.

Normal charging rate (at charging receptacle).

Size of train wires, No. — B. & S. Gauge.

Number of train wires (2 or 3).

Capacity in amperes of generator.

Setting of axle generator.

Current output—amp.

Automatic switch—volts.

Zero charge relay—volts.

Lamp regulator—volts.

Amperes—full light.

Diameter of axle pulley. (Outside.)

Diameter of axle bushing. (Outside.)

Diameter of axle bushing. (Inside.)

Diameter of generator pulley. (Outside.)

Diagram of connections showing location, type and ampere capacity of fuses.

2. That where train line connectors are used, Gibbs' No. 3-G train line connector be used, with connections to the battery, dynamo and jumper as shown on Fig. 1. If only

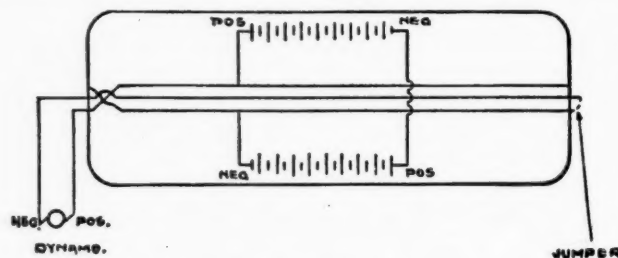


Fig. 1—Connection of Battery to Train Line.

two wires are used, they shall be connected to the two outside terminals and the female connector on each end of car shall be stenciled "Not for use on head-end system."

3. That batteries shall be connected up with the positive to the right, facing the car, as shown on Fig. 1.

4. That where double compartment tanks are used, the connections and arrangement of battery terminals are to be shown on Fig. 2.

5. That each electrically lighted car shall be provided with two charging receptacles with swivel supports installed one on each side of the car, the outside angular ring to be the positive.

6. That each electrically lighted car be provided with two

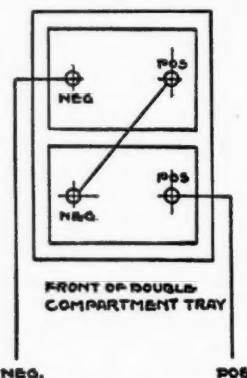


Fig. 2—Arrangement of Terminals.

150-ampere fuses, close-connected to each battery terminal; the fuses to be arranged and placed in a cast-iron box.

7. That each electrically lighted car shall be provided, on the switchboard in the car, with a switch, a fused switch, fuses or terminals. The switches, fuses or terminals to protect and completely disconnect the following parts: Train line (where train line is used), battery, axle dynamo (where axle dynamo is used). The axle dynamo switch or fuses to control the positive, negative and field of the dynamo. Each of the above switches, fuses or terminals is to be plainly stenciled, designating the part controlled, the positive terminal to be on the right side facing board.

8. Where a main lamp switch is used or where fuses controlling all lamps are used, they shall be so stenciled in plain letters.

9. That all fuses on cars shall be National Electric Code fuses.

10. That where axle dynamos are used, negative, positive and dynamo field shall be fused as close as possible to the



dynamo and prior to the leads either entering the conduits or being secured to the bottom of the car. The above fuses to be used for emergency service only and are to be at least one hundred per cent. above the capacity of the fuses on the switchboards protecting the same leads.

11. The following voltages should be used:

60 volts (nominal) for straight storage, head end and axle dynamo systems.

30 volts (nominal) for straight storage and axle dynamo system.

12. That the batteries shall be preferably installed in double compartment tanks.

13. That battery boxes shall have a vent provided in each door.

14. That when facing the end of the truck on which axle generator is mounted, the pulley or sprocket shall be on the right-hand side.

15. That the rules of fire underwriters shall cover all car wiring.

16. That all wiring under car to the switchboard shall be run in conduits.

17. That a straight pulley seat be provided for the axle pulley. That if a bushing or sleeve be used it must be secured to the axle independent of the pulley. Bushing to have an external diameter of  $7\frac{1}{2}$  in. and to be  $8\frac{1}{2}$  in. long, turned straight. That the pulley hub have a uniform internal diameter of  $7\frac{1}{2}$  in., the length of the hub to be  $6\frac{1}{2}$  in., the face of the pulley to be 9 in. or wider if flangeless, and 8 in. if flanged. That the generator pulley be flanged, crowned and perforated, and have an 8-in. face.

The following changes have been made in the 1910 exhibits to conform to the recommendations of 1911:

Exhibits *E* and *F* have been changed so that the fuse box will accommodate an N. E. C. fuse. On the floor plan in Exhibit *E* the fuse box has been changed to a location along the end of the battery box.

Exhibit *H* has been changed to show the Gold positive plate the same dimensions as the Wilard positive plate.

Exhibit *H* has been changed in that the length of the negative bridge has been changed from  $10\frac{3}{16}$  in. to  $9\frac{3}{4}$  in., also added on Exhibit *H* recommended dimensions for the National battery.

On Exhibit *I*, the detail of chest handle, a lip has been added at the top and projects into the wood tank.

Exhibit *H* has been changed in that the crown of the lead line is specified as three to four per cent. antimony lead instead of pure lead.

On Exhibit *G* the method of applying lead lining has been changed to read as follows: "Size lead tank with one coat of chrysolite, then with pretrolite and then insert in wooden tank which has been filled to a depth of 2 in. with a mixture of paraffin and pretrolite, having the melting point 150 deg. F.

On Exhibit *G* the abbreviation S. B., indicating Single Braid wire for cross section, omitted; unbraid wire to be used.

Item 31 on Exhibit *G* covering No. 6 flexible rubber-covered wire changed to show solid wire.

Exhibit *K* has been changed to show recommended design of vent for battery door.

In connection with Master Car Builders' Rules covering interchange of equipment, your committee suggests that the paragraph at the bottom of page 103 reading:

"On electrically lighted cars a battery depreciation charge of 75 cents per day shall be made," be changed to read as follows:

"On electrically lighted cars, furnished to foreign roads, where no agreement is made, the following charge shall be made per day for use of batteries:

	Depreciation.	Current.	Total.
32 cells .....	46 cents	29 cents	75 cents
16 cells .....	23 cents	14 cents	37 cents

The report is signed by:—T. R. Cook (Penn.), chairman; E. A. Benson (Pullman), Carl Brandt (L. S. & M. S.), Ward Barnum (L. & N.), and J. H. Davis (B. & O.).

#### DISCUSSION ON TRAIN LIGHTING AND EQUIPMENT.

G. W. Wildin (N. Y., N. H. & H.): There are a number of recommendations made in that report as to certain special devices, and I would like to inquire if they are patented.

D. F. Crawford (Penna.): It is my understanding that none of the patents are still in existence on those devices.

C. A. Schroyer (C. & N. W.): We have with us this morning J. D. Cartwright, of the Lehigh Valley. He is an electrical engineer and he is also the chairman of the committee on standards of the Association of Electrical Engineers, and I move that he be extended the privileges of the floor for five minutes.

(Mr. Cartwright was given the floor).

Mr. Cartwright: Before making any remarks on the subject under consideration I wish to state the interests I represent and the reason for my appearing before you to-day. As an individual I represent the Lehigh Valley; I also represent the Association of Railway Electrical Engineers. At a recent meeting of our Association the present report of your committee was thoroughly discussed and I am here to present for your consideration the wishes of the Association of Railway Electrical Engineers, primarily formed for the purpose of standardizing as far as possible the electrical equipment on cars. Fully realizing the importance of the subject, I hope you will bear with me for a few moments in the presentation of the subject which will be submitted to you for your consideration. I take this opportunity to thank your committee on train lighting for their hearty co-operation in embodying in their report several recommendations which have been made by our Association. We do, however, take certain exceptions to a few of these recommendations, as follows:

*Sec. 1* Should be changed to include additional information not shown.

*Sec. 2*. The first line, after the word "used" it was suggested that there should be inserted the words "they shall be interchangeable with."

*Sec. 5*. After the word "car" in the first line insert the words "equip with battery boxes."

There is no necessity of putting a charging plug on an electrically lighted car that has no battery boxes in it.

*Sec. 6*. Should read: That each electrically lighted car be provided with two 150-ampere fuses close connected to positive and negative terminals of batteries, at battery box, before wires enter conduit leading to distributing board in car. The fuses to be arranged and placed in a strong metal box, substantially as shown on Exhibit *F*, and installed on car as shown on Exhibit *E*.

*Sec. 7*. Omit the word "completely" in the fourth line. Also omit the second item. We have found several instances where porters on the cars have pulled the battery switch instead of the light switch. The result is that all the lamps in the car have been burned out, due to the excessive voltage generated.

The sixth line should read as follows: The axle dynamo switch or fuses to control the positive armature and positive field of the dynamo.

We had considerable discussion on *Sec. 10*. We wish to eliminate all fuses that we can from a car, consistent with safety. It might be practicable to put a few in your armature, but do not put any in your field or both sides of your armature circle.

*Sec. 11* should read as follows: The following voltages should be used:

For head end or straight storage, 64 volts (nominal).

For axle dynamo systems, 32 volts (nominal).

You will notice that we have omitted the recommendation for 30 volts for the straight storage system. On the second part we have omitted straight storage. It was not considered practicable to operate straight storage on 30 volts.

There is one typographical error which has crept into *Sec. 17*. In the seventh line the figure "7" should be inserted instead of the figure "8," as the dimensions for the face of the generator pulley.

At a meeting of the members of the Association of Railway Electrical Engineers, held in Washington on June 16, 1911, it was voted that the recommendations of your committee regarding interchange of electric lighted cars should read as follows: On electrically lighted cars, furnished to foreign roads, where no agreement is made, a charge of 75 cents per car per day shall be made for the use of the electric lighting equipment.

If any of the suggestions or recommendations that I have made are out of order, I would ask you to excuse my presumption, but accept the recommendations of the Association of Railway Electrical Engineers just the same.

(The President resumed the chair).

Mr. Wildin: I would like to know whether the committee in formulating this report took into consideration the fact that some roads are being electrified, and that the charging of the batteries on the car will be taken care of while the cars are on the electric zone? I notice that the gentleman who has just spoken, Mr. Cartwright, recommends a 30 volt system where axle light is used. I would say that you must use axle light for the time being, but it is presumed that in the future the dynamo will be removed and the batteries will be charged while the cars are on the electric zone, and in that case 30 volts is very low.

Mr. Cartwright: If the axle light equipment is removed from the car, then you are not confined to 30 volts.

Mr. Wildin: But I understand you to assume that you were going to have 30 volts.

Mr. Cartwright: Not necessarily.

Mr. Wildin: Then you will have to put in something else.

Mr. Cartwright: We will go to 60 volts.

Mr. Wildin: Then what is the use of throwing a battery away?

Mr. Cartwright: When you go to 60 volts you add a battery.

Mr. Wildin: We are going to put a motor generator set in the electric locomotive and charge the cars while on the electric zone. We are going to have 60 volts, and I do not like the recommendation of a 30 volt system where axle light is used.

(The report was accepted and referred to letter ballot.)

M. K. Barnum (I. C.): It seems to me that in referring this report to letter ballot the members would have to vote on it as a whole and not in detail.

The Secretary: That will be arranged.

C. A. Seley (C., R. I. & P.): In referring the report to the members for letter ballot I would suggest that the recommendations of the Association of Railway Electrical Engineers, which have been voiced here by Mr. Cartwright, be put in form so that our members may consider them in casting their ballots.

Mr. Schroyer: If that is a motion, I second it.

(The motion was carried.)

#### TRAIN PIPE AND CONNECTIONS FOR STEAM HEAT.

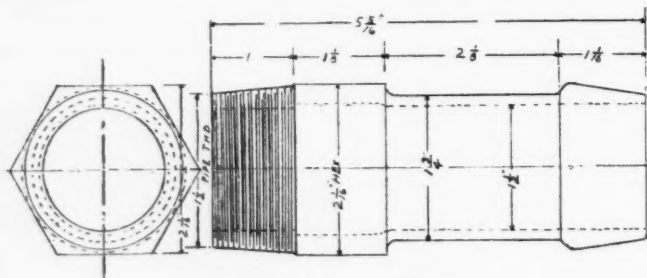
The committee recommended that the following Recommended Practice be adopted as Standards: Two-inch train pipe; end valves with not less than 1½-in. openings, and



I. S. Downing,

Chairman, Committee on Train Pipe and Connections for Steam Heat.

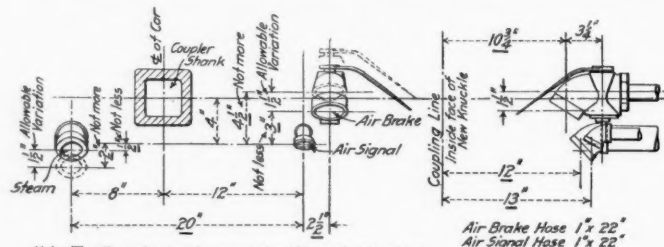
location of steam, air and signal pipe as shown in the accompanying illustration. The location of pipes is changed to show the dimensions taken from the center line of the car instead of the center line of the coupler shank. The committee finding but few railways using a hose larger than



Nipple for Steam Hose.

1½ in., recommends that the present Recommended Practice of 1¾ in. hose be changed to 1½ in. It also recommended for adoption as Recommended Practice the following: Hose nipples of dimensions shown in the accompanying illustration; steam hose to be 5-ply, 1½ in. inside diameter and 25 in.

long; hose c'amps to the dimensions as shown in the accompanying illustration; each end of hose to be fitted with a nipple, and the coupler to have not less than 1½-in. opening. The horizontal elevations of nipple to opening through this

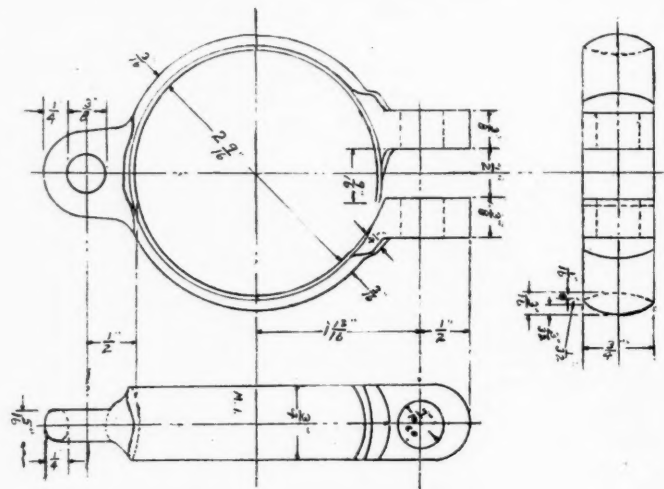


Note: The dimensions underscored should be maintained but departure from other dimensions are allowable to suit conditions. Opening shown on steam line is the opening at end of valve.

Location of Steam, Air and Signal Pipes.

coupler to be, minimum, 15 deg.; maximum, 20 deg. The coupler to be tapped with 1½-in. pipe thread.

It is further recommended that manufacturers of steam hose couplers be asked to appoint a committee to act jointly with a committee of this association and to report at the



Recommended Hose Clamp.

next convention on the contour lines of a coupler that will be interchangeable.

The report is signed by:—I. S. Downing (L. S. & M. S.), chairman; H. E. Passmore (T. & O. C.), T. H. Russum (B. & O.), J. J. Ewing (C. & O.) and C. A. Schroyer (C. & N. W.).

Mr. Downing presented the report and in connection therewith said:

The recommendations concerning the train line, end valves and pipe locations have been recommended practice since 1903, and we are inclined to feel that they should be advanced to standard. In connection with the steam hose couplers, there is but very little difference in the large couplings—about 3/16 in. on the locking arm—and we feel that the coupler manufacturers, if they work with the committee—we would get a coupler that would be interchangeable.

In regard to Fig. 1, that has always shown the dimensions taken from the center line of the coupler shank. The committee has changed that, showing the dimensions taken from the center of the car. The figures are just the same. It does not change the location of the end valves or pipe. The straight shank couplers are coming in now, and the old coupler shank is offset an inch and a half from the center of the head and as the coupler is not always in the center of the car, it is a hard proposition to measure, and we have found that most of the roads have measured from the center of the car.

#### DISCUSSION OF TRAIN PIPE AND CONNECTIONS FOR STEAM HEAT.

C. E. Fuller (U. P.): In regard to the length of steam hose, I think 25 in. is too long—in fact, 24 in. is pretty long—it is bringing the hose too close to the track. I think it would be a mistake to increase the length of hose over 24 in.



I would like to ask whether or not the committee in working up this report gave any consideration to changing the angle of the neck of the coupler to change the kink in the hose when coupled together. I think it is safe to say that the majority of hose connections, when they are coupled together are kinked, which cannot help but destroy, to a certain extent, the life of the hose. We have been using it in that manner, and I have observed on a great many other roads that it seems to be the common practice. We have got now to a point where we cannot get an angularity of the coupler that will prevent that kinking entirely, and I would like to see this committee continued with a view to making a further report on this subject. I will make that motion.

Mr. Downing: I overlooked something I should have referred to. The committee on standards in their report yesterday referred to certain matters which in turn were referred to our committee. One was the size of the hose on passenger trains. Our committee did not feel they should take any action on this matter, as we were appointed to consider the matter of steam heat connections. In regard to showing the angle cock at 30 deg., we agree with the committee on standards. As to Mr. Fuller's remarks concerning the kinking of the hose, until you adopt a standard end valve, a standard coupling, you cannot get away from it. The angle at which the hose leaves the end valve and goes into the coupling governs. I have no objection to the committee being continued, but I do feel that what we have recommended as a standard for this association should be made standard and that the members of the association should adopt the standard in practice. It has been on the books since 1903, and should either be made standard or taken off the books.

Mr. Fuller: That is the reason why I made the motion to continue the committee. I do not believe that this association desires to adopt the present practice. I did not know until about one month ago that we could accomplish what I would like to ask this committee to present to us, and I wish to take exception to the remarks of the chairman of the committee that we have to use one angle valve for the end of the car or one coupling. Any pipe fitting can be brought to the required angle, whether it is a globe valve or angle valve or simply a T on the end of the pipe. The angularity of the coupler has more to do with it than the connection of the train pipe line.

I should like to see this committee charged with recommending the adoption of a standard size of hose. If you want it one 5/8-in. adopt that, not 1 1/2-in. I also think the committee should be charged with something in the way of a nipple besides the old style nipple, with which we find it is almost impossible to hold the hose on, especially with head-on system, where we use anywhere up to 200 lbs. steam pressure. There is a nipple which I submitted to the committee which is not patented, at least the patent is not valid, and everybody is making it, and every steam heat hose company and a great many of the roads have their own patents and are using it. If there is any question about patents then I would suggest that question be considered. I do not want to recommend a patented device, but do want to recommend a positive nipple and clamp for a hose connection.

C. H. Osborn (C. & N. W.): In designing a standard coupler I think that consideration ought to be given to the question of designing some kind of a positive lock that will hold the couplers together. We have a number of different kinds of couplers to-day that can be coupled together, but cannot all be locked together, and that is the greatest objection I have to the different kinds of couplers. Another thing, I do not quite agree with the recommendation concerning Fig. 2; that the hose should be fitted up with a nipple on each end and screwed into the head. We found where that is done, that the heads are kept at outside points, unscrewed from the hose, and new hose are attached and screwed into the heads, and the heads kept in continual service without having to go into the shops and be looked over and fixed up, and that is the cause of a great deal of trouble with the joints on the head. I think the head that is clasped to the nipple, so that when the hose gives out the head has to go into the shop with the hose, where is an opportunity for testing it and grinding in the joint for the gasket, etc., it is a much better plan and it gives us an opportunity to shop them and fix them up.

Mr. Downing: In regard to Mr. Fuller's remark about the nipple, when Mr. Fuller submitted to us the print to which he has referred, we took the matter up and we were advised that it was a patented device, and I think the clamp referred to by Mr. Fuller is a good deal better than this clamp, but we understood it was patented and did not consider it. In regard to the two-piece coupling, we felt that it would be a long time before this committee would be able to get a coupling that would be adopted, so we thought if we could get

a two-piece coupling, we would not have to change the hose and coupling at interchange points as we are doing now all over the country. The committee should be instructed to act with the manufacturers of hose couplings. The committee would not attempt to design a coupling in two pieces, if we are going to have a standard. We simply wanted to have that as a makeshift.

F. W. Brazier (N. Y. C. & H. R. R.): As long as we have plenty of time, we might make an experience meeting of this. Regarding the length of steam hose, we find on our long 70 and 75 ft. cars with our short and sharp curves, we must have a hose at least 25 in., and if we did not have it that length we would have considerable trouble. After a hose is in service for a while it congeals so that it becomes sometimes 1 1/2 in. shorter than it was when applied. On our system we have some pretty severe weather, and do not find any necessity of having any locked couplings. I think our records will show that during the severe weather we have trouble sometimes, in going over our water tanks, where a piece of ice will uncouple everything, but for steam hose to be uncoupled in ordinary service is something unknown to us. We have a heavy head and it practically locks itself. As to the end train pipe valves, as referred to by the chairman of the committee, I thoroughly agree with his statements. As to blowing off, I find the trouble which causes the blowing off is generally that the inside lining on the head end system, Mr. Fuller speaks of, it softens up and peels off. That happens on our lines occasionally, but hardly enough to notice it.

Mr. Fuller: I ask Mr. Brazier if it is not usually kinking that makes the hose shorten—if they did not kink, do you think they would shorten up as much?

Mr. Brazier: That contributes to it, but take some of the hose put in yard service, and confined in service, where we have from 75 to 125 lbs. pressure, the hose congeals and contracts after it is in service and shortens up.

R. L. K'ene (Penn.): When the report of the committee of standards and recommended practice was considered there were several items left over until the presentation and discussion of the report of the committee on train pipe and connections to steam heat, and I would make a motion that paragraphs 50, 51 and 52 of the committee of standards be referred to letter ballot.

The motion was put and carried.

Mr. Downing: In case this committee is continued, I believe it should be instructed whether you want it to design the hose coupler complete, or give you the contour lines so the manufacturers can work to that, the same as we do in the case of the automatic coupler.

Mr. Fuller: It is not my thought to tie this committee down at all. I would like to turn them loose to cover the whole subject. If they can recommend a standard steam heat coupling and connection, hose and everything incidental to the system of steam heat, to this association, I think we should let them do it, and under my motion they are free to take up the whole subject without any strings to it.

T. H. Curtis (L. & N.): As Mr. Brazier says this is an experience meeting and I will say that the Louisville & Nashville R. R. equipped its passenger equipment with 26 in. hose, but it was so long we had to shorten it, and we now use 24 in. hose with good results. That is an inch shorter than Mr. Brazier is using and I feel safe in saying that a 26 in. hose is quite too long.

O. C. Cromwell (B. & O.): I think we should give consideration to some method of locking the couplings together. I have had considerable experience with the coupling opening after the hose has become set and hardened. In connection with the opening up of the steam-heat hose, it sometimes causes signals to be given to the engineer, through interfering with the hose. The whole subject is one which appears to need considerable revision at this time. I am not sure that the location of the train pipe at the end is correct, particularly as we are going into greater length of car. We have to have a greater lateral motion of the coupler, and to my mind that must spread the ends of the pipe, and I think the proper thing is to leave this matter wide open and leave it in the hands of the committee to make a thorough revision of the whole matter.

Mr. Fuller: I move that the committee be continued to take up the entire subject of steam-heat hose and connections, including a locking device, location of the train line pipe, angularity of the head and its connection, length of hose, and in fact the entire subject of steam-heat hose and connection for passenger car equipment.

(The motion was seconded and carried.)

Mr. Fuller: I move that the report be accepted and referred

back to the committee. (The motion was seconded and carried.)

#### CONCLUDING EXERCISES.

The Secretary stated that the auditing committee had examined the accounts of the secretary and treasurer of the association, including the vouchers, and had found them correct.

The following report of the committee on correspondence and resolutions was presented:

The committee wishes to acknowledge the appreciation of the association to the President, for his very able address and ability with which he presided; to the other officers for their good work in handling the details; to the committees that have considered and reported on the subjects assigned to them and for the thorough manner in which their work has been performed; to the committee on arrangements for effective service in attending to the comfort and pleasure of those attending; to the railways and the Pullman Company for courtesies extended. To the American Railway Supply Men's Association for its magnificent exhibition of railway supplies that have become so important a feature of these conventions and the entertainment provided by that Association. To the press in general for their co-operation and interest. To the *Railway Age Gazette* for the daily record of our meetings.

On motion, the report of the committee was adopted.

D. F. Crawford (Penn.): We have tried the present method of elections for two years and it seems to me it is unnecessarily cumbersome. I therefore move that the executive committee be authorized to appoint a committee, with a view of simplifying them, and to transmit a circular report to the members by December 1, which covers the six months' period required, and report their recommendations at the next meeting. (The motion was seconded and carried.)

I. S. Downing (Ill. Cent.): We have a lot of apprentices in our car shops, and we are getting a lot of steel passenger cars and pretty complicated things around the cars now, and I do not know but what we ought to have subject of that kind in this association as they do in others. We have about 40 apprentices in our shops, and I believe other shops are doing the same thing, and it might be a good thing to consider this matter.

D. R. MacBain (M. S. & L. S.): I think Mr. Downing's suggestion is a good one. There is very little attention paid to the development of the young men for the car department on a good many of the roads, and it would seem in view of the fact that the work is becoming more complicated and the material for advancement is becoming scarcer every day that something should be done to encourage young men to take up car department work.

C. H. Osborn (C. & N. W.): I agree with the idea Mr. Downing has advanced. We are having a great deal of trouble in getting young fellows to take up car department work, and are having a good deal of trouble in filling the position of foreman for the various shops and yards and I think some move should be taken by this association toward securing a good grade of apprentices in the shops. I believe it will assist us very much.

Mr. Downing: I would move that a special committee be appointed to make a report at the next convention on this subject of apprentices in car shops. (Motion seconded and carried.)

The president: I suppose some of you have noticed that you did not receive reports. I would say that the executive committee has been for years urging the chairmen of various committees from time to time to be prompt in presenting their reports so that the matters might receive careful consideration by all concerned. It seems that this year the reports were more delayed than ever before. Indeed, some reports were not here until a day or so before the opening of the convention. I think this is a matter to be regretted.

D. F. Crawford (Penn.): Mr. President I would suggest that you call the attention of the members to the provision of the By-Laws in respect to reports.

C. A. Seley (C. R. I. & P.): It occurs to be that it would be advisable for this association to invite railway officials to visit our conventions and see the magnificent exposition of railway appliances. There is no question but that we have on this pier a most complete exposition of railway appliances, and it is an exhibit that would be of very great value to every railway official from the president down. It is true that the exhibit is seen by quite a number of purchasing agents, but I do not think it is viewed generally by the executive officers. The value of this association to the railways is undoubted in many quarters, but there are some railways I understand that do not extend to

their men the opportunity of attending these conventions. Now I believe we should make an effort in this respect and therefore I make a motion that the executive committee of this association extend to the executive committee of the American Railway Association a cordial invitation for them to individually visit our next convention, wherever it may be held, and suggest the advisability of their appointing a committee to visit the convention and report back to their association.

(The motion was carried.)

O. C. Cromwell (B. & O.): Referring to the delay in getting out reports, I would say that the committees would be greatly assisted if the membership of the association would reply promptly to the circulars. I think a great deal of the delay in getting out the reports is due to that fact. I am sorry to say that a great many reports are meagre that are sent in to the executive committee. Hence, it leaves the committee a great deal of work to do in comparatively short period of time. If the members will bear this in mind it will facilitate the getting out of reports very much.

J. J. Tatum (B. & O.): Mr. Cromwell criticizes the railways. Now I think I will take the other side and criticize the committees. If a committee waits until the eleventh hour to get out circulars seeking the information that it wants, why, naturally there is going to be delay. I happened to be on one of the committees that did not have a meeting this past year; I don't know why, but I know that a typewritten report from the committee was here. I don't know how it happened to be made. I think if committees would get busy right away after they leave the convention and decide on what they want and promptly send out circulars to the railways asking for the information that they need it will greatly facilitate the getting out of these reports.

C. D. Young (Penn.): I would suggest that the executive committee can help the committees quite considerably. The executive committee usually does not meet until August or September, and then it appoints the committees for the next year, and by the time those committees have gotten together the information and printed the same it is December or perhaps January of the next year. The replies to the circular sent out are hard to get at best, and the members of the committees have hardly much over 30 days or 60 days at the outside, and a great many of the replies require investigation, and when you get the replies in they have to be boiled down and condensed, all of which takes time. I think it would materially assist the association if the committees could be appointed earlier, and then when they are appointed instructions issued to the chairman of the various committees to call the members together promptly.

E. W. Pratt (C. & N. W.): I would suggest that it would be helpful to all members if, in addition to notifying each committee independently, there was a list made of all the committees, with their various chairmen, and this list sent out to the members as early as possible, stating the subjects to be considered, and also if there are any detailed instructions to be given to the committees as to getting up their reports a brief outline of them should be given. The thought in my mind is that in that way many of us would look out for information early in the year, and it might be that somebody would offer information without waiting to be requested for it by a committee.

C. A. Seley (C. R. I. & P.): I move that the appointment of the committees be issued by the secretary in circular form to all members.

(The motion was carried.)

R. L. Kleine (Penn.) In connection with the work of the committee on standards, I desire to say that when a circular is sent out we get a great many replies upon the subject matter that refers directly to the work of other committees, and I would suggest that members bear in mind that we have other committees on those particular subjects. That I think will obviate some of the delay. If members would refer those subjects, where there is either a standing committee or a special committee on the particular subject, directly to those committees or empower the committee on standards to do so, it will expedite the work of the association a great deal.

The following officers were elected: President, A. Stewart Southern; first vice-president, D. F. Crawford, Pennsylvania; second vice-president, C. E. Fuller, Union Pacific; third vice-president, M. K. Barnum, Illinois Central; treasurer, J. S. Lentz, Lehigh Valley. Executive Committee—F. W. Brazier (N. Y. C. & H. R.), C. A. Schroyer (C. & N. W.) and A. Kearney (N. & W.).

President Curtis was presented with the ex-president's badge and the meeting adjourned.



## SAFETY APPLIANCES.

The recommendation of the committee on safety appliances, presented at the meeting on Tuesday, June 20 (*Daily Railway Age Gazette*, June 21, 1911, page 1602), was not reported correctly as to the designating mark for cars equipped with the safety appliance standards. It should have read as follows:

The committee recommends the following designating mark for cars built on or after July 1, 1911:

UNITED STATES  
SAFETY-APPLIANCES  
STANDARD.

and for cars built prior to July 1, 1911—

UNITED STATES  
SAFETY-APPLIANCES

(The letters U. S. may be used in lieu of United States.)

The first part of the paragraph referring to the metal badge should have read: "A metal badge plate 4 in. x 12 in., with the proper marking, is preferred." The badge plate is also to be made of metal and not of malleable iron, as reported.

A decree has been issued by the government of Uruguay authorizing the provisional opening to public service of a section of 31 miles of the Midland Railway branch from Algorta to Fray Bentos, now in course of construction. The new section completed is between kilometers 34 and 87.

## The Exhibit.

## McCord Locomotive Lubricator.

The system of force feed lubrication, as supplied by McCord & Company, Chicago, is designed to provide an efficient method of lubricating a locomotive automatically, positively, and in proportion to the work the locomotive is performing. The system is applicable to the valves, cylinders and air pumps, as well as to the driving boxes. In valve and cylinder lubrication the valve oil is introduced at a point where it will mix with the steam just before the latter enters the steam chest on both piston and slide valve engines. In driving box lubrication the engine oil is introduced into the longitudinal cavity in the crown of the driving box brass.

The lubricator proper consists of individual vertical plunger pumps for each feed set in an oil cup or reservoir, located usually in the cab. Eccentrics on a horizontal shaft through the reservoir operate the plunger pumps. The circular motion of the shaft is obtained from the rectilinear motion of the valve stem by means of a flexible shaft and a set of bevel gears with a ratchet attachment on one gear which is connected direct to the valve stem or rocker. This bevel gear or transformer may be located on the running board or on a bracket on the boiler where convenient attachments can be made to the lubricator proper and to the valve gear of the engine.



Some Workers on the Transportation Committee.

Top row, left to right: Underhill, Hawley, Toomey, Elliott, Taylor, Stuart, Berger.  
Bottom row, left to right: McNaughton, Nicol, Kuhns (chairman), Porter, Peabody.

**PRESSED UNIT CAR SIDE SECTION.**

The pressed unit car side section as made by Forsyth Brothers Company, Chicago, represents advanced development of the built-up steel truss side construction. The latter, while utilizing the full height of the side of the car for a lattice girder or truss (having the diagonals so disposed as to permit of windows being formed in the structure), has resulted in a car body of maximum strength and rigidity, with minimum weight. As the life of a steel car depends so much on the security of the joints of its members, it is obvious that the fewer the joints the better will be the car. This latter consideration led to the invention of the pressed unit section, wherein the side posts, diagonal braces and side brace of the car are formed of one piece of metal.

As to the safety of passengers in a truss side frame car, the distribution of shock resisting members in the truss frame results in practically surrounding the passenger space with a metal shield. The buffing shocks can be taken by a comparatively light center sill construction, as this sill can be supported and secured from deflection at each side post by the rigid frame.

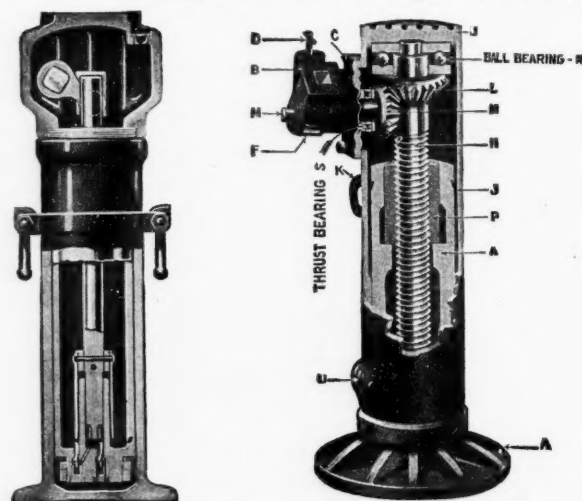
Weight for weight, a car built with the pressed unit side truss will be more rigid and provide greater security to passengers than a car having all its shock resisting members in the underframe, or relying on a plate girder side construction having its top member below the sash rest. As an illustration, in a mixed freight train of flat cars and box cars, a severe collision results in more wrecked flat cars than box cars.

This form of construction may be adapted to any design of car or underframe.

**HYDRAULIC JACKS.**

The new forged steel Duff-Bethlehem hydraulic jacks were shown by Fairbanks, Morse & Co., Chicago. Several new features are to be found in these jacks. There is no packing at the

is claimed to be capable of taking care of any kind of railway equipment under all conditions. The jack is made of malleable iron and steel, except all bearings, which are of hard bronze. The automatic lowering device is simple and is arranged so that when the load is being raised there is no part of the lowering



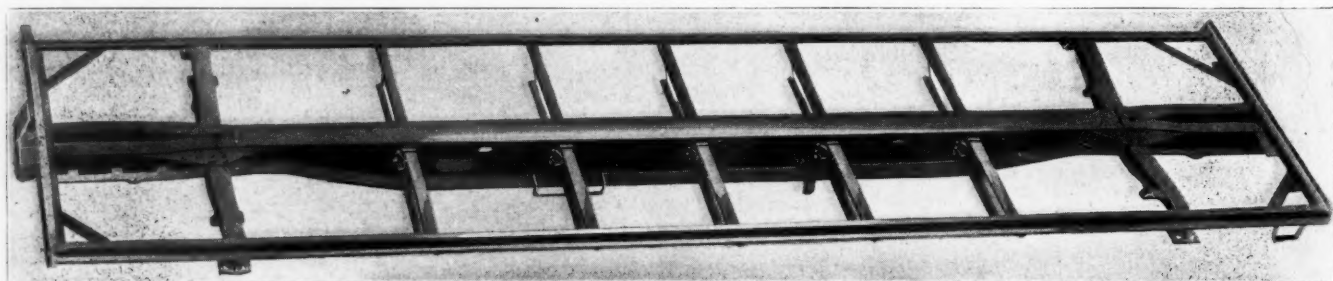
**Duff Bethlehem Forged Steel Hydraulic Jack.**

device in service, it being dropped out of the way. A full line of these jacks were exhibited at the booths of Fairbanks, Morse & Co. and the Duff Manufacturing Co., spaces 550-630-548 and 628 in the Annex.

**BETTENDORF UNDERFRAMES FOR BOX CARS.**

Herewith are illustrated two types of underframes of the Bettendorf construction, single center sill and double center sill, both of which were exhibited by the Bettendorf Axle Company, Davenport, Iowa, at space 200.

The single center sill underframe shown is designed for use under 40 ft. box cars of 100,000 lbs. capacity, of which

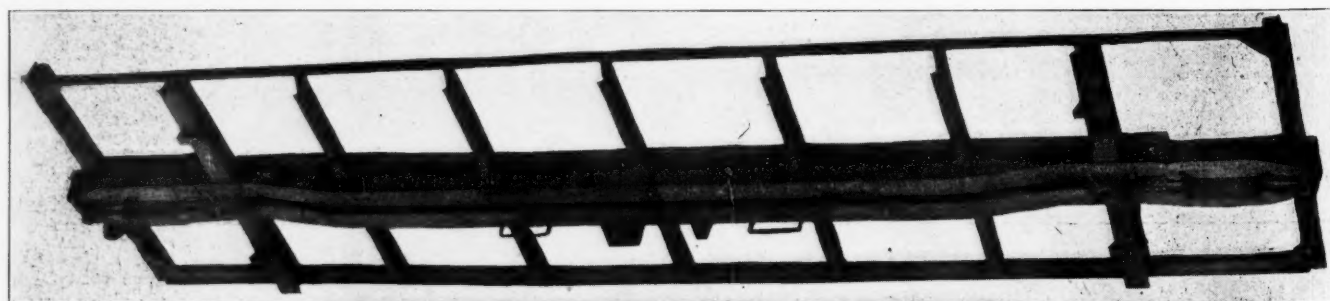


**Bettendorf Single Sill Underframe for Box Cars.**

base, as this is forged integrally with the cylinder, making it one solid piece with no joints whatever. On account of their steel construction, these jacks combine large capacity with light weight. The latest development of the geared ratchet jack is the No. 400 Barrett jack, which is designed particularly for the rapid, safe and convenient handling of the heaviest loaded freight cars, passenger or Pullman coaches, locomotives in roundhouses, etc. It

there are now over 8,000 in service. These underframes, like all other Bettendorf underframes, were designed to carry the required load with the least possible dead weight and having the fewest possible number of pieces.

The double center sill underframe, designed for 36 ft. box cars of 80,000 lbs. capacity, possesses the usual light weight, maximum strength and few parts, as well as accessi-



**Bettendorf Underframe with Double Center Sills for Box Cars.**



bility to inspection, repairs and painting, which qualities are found in all the product of Bettendorf Axle Company, Davenport, Iowa.

In both these designs the center sill carries the entire load, which is transmitted to it by means of the continuous bolsters, needle beams and end sills. These needle beams and body bolsters are continuous from side to side of the car and pass through the center sill, which is continuous from end sill to end sill.

The center sills in these underframes are shaped and punched cold in powerful hydraulic presses in such a manner that one-half of the beam is punched in one stroke of the press, thus making all sills interchangeable, with no variation in the spacing of holes and preventing the possibility of internal forging stresses. Consequently no drift pins or reamers are required to match rivet holes and no metal is fractured by drawing up with drift pins.

To the ends of the center sill I-beams, which are rolled shapes, are riveted thoroughly annealed open hearth cast steel draft sills, or center sill ends. Cast integral with these draft sills are the draft gear stops, connections to the end sills, etc., making a solid casting—one-piece—which eliminates the shearing of rivets and insures alignment of all parts, thereby greatly facilitating the application of the draft gear in the proper manner.

The needle beams are made from rolled I-beams and are continuous from side to side of car, passing through the center sill and resting directly on the opening in the center sill through which they pass. These needle beams are spaced at such intervals as necessitated by the size of the wooden sills or nailing stringers, from which the load of the floor is transmitted through these beams directly to the center sill.

#### PORTABLE AIR COMPRESSOR.

The portable air compressor made by the General Electric Company, Schenectady, N. Y., and shown in the accompanying illustration, is used for furnishing compressed air for blowing out apparatus, driving small tools, etc., in small plants where it is not advisable to install a permanent system of piping. To facilitate handling, the compressor is mounted on a three-wheel truck, the single wheel in front carrying a handle, which permits of easy transfer and of turning sharp corners. A sheet iron plate, carrying four posts, occupies the rear of the truck, and forms a convenient support on which to coil the hose, when not in use. The compressors furnished with these sets are single acting, single stage, with horizontal cylinders. The motor drive is accomplished by means of a gear and pinion having herringbone teeth. The frame casting encloses the working parts of the compressor, and contains both the motor and crank shaft bearings. The motor frame is bolted to the compressor frame. This makes a compact arrangement and eliminates the necessity of a separate gear case. With this construction the dimensions of the motor are not limited by the distance between gear centers, and it has been designed with electrical characteristics best suited to its service. All bearings and working parts are automatically lubricated from a well formed in the compressor frame immediately below the gear. The driving gear picks up oil from the well, and throws it in a steady stream into an oil pan on the underside of the crank chamber cover, from which the oil flows through channels to the various bearings.

The armature and the interior of the motor are protected from oil by deflectors on the armature shaft, which divert any oil that may pass the motor bearing into a pocket from which the oil returns to the crank case through a hole entering it below the oil level. The oil therefore acts as a seal, preventing oil vapor from entering the interior of the motor. A dust-proof door, closed by a cam locking device, is provided in the cover where it is immediately accessible from the side of the car. This door permits convenient inspection of the brushes

or commutator when required. The armature can be quickly removed when occasion requires, by taking off the motor frame head, turning the brush holders back and loosening the pinion nut without having to touch the crankshaft gear. In order to maintain an air pressure within specified limits, standard governors are used to close the motor circuit when the pressure falls below a predetermined value and to open the circuit when the pressure rises to another predetermined value.



Portable Air Compressor.

Adjustment for pressure range can easily be made by means of two screws located in the upper part of the governor frame.

The storage reservoir is 18 in. in diameter, 60 in. long and is located below the truck frame, thus keeping the center of gravity of the set low and insuring stability to the equipment. The capacity of the reservoir is approximately  $8\frac{1}{2}$  cu. ft. and is sufficient to maintain a steady supply of air through the outlet nozzle for ordinary service, such as operating pneumatic tools or for cleaning purposes. A drain cock is placed in the bottom of the reservoir to drain off any water or sediment that may collect. The over-all dimensions of this portable set are: Length (not including the handle), 6 ft.  $8\frac{1}{2}$  in.; width, 2 ft. 8 in.; height, 3 ft. 9 in.; clearance between end of drain cock and floor  $2\frac{1}{2}$  in. The net weight is about 1,600 lbs.

#### CRECO JOURNAL BOX.

The Creco journal box and lid exhibited by the Chicago Railway Equipment Company, Chicago, form a dust proof box, the lids having no projections beyond the edges of the mouth of the box. An additional safeguard against the working of dirt into the box is provided by the oil table on the inside of the lid, so arranged that all oil thrown against the inside of the lid, instead of working to and oozing out between the lid

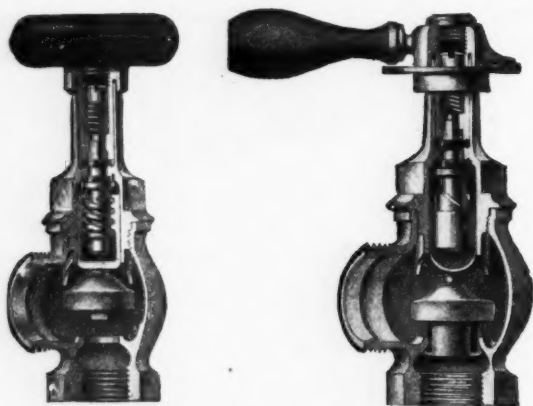


Creco Journal Box and Lid.

and the box, is thrown back into the box. Again, there are no openings in the lid to allow dirt to sift through. The Creco box has an automatic and permanent locking device which is simple and effective. The lid is easily opened and no special twist or pull is necessary, all of which tend to increase the life and reduce the cost of maintenance. The arrangement of the springs places equal pressure on all parts of the lid, thus insuring a close contact between the lid and box at all times. These lids and boxes are so designed that the Creco lid will fit and lock as readily on any standard M. C. B. cast steel or malleable box as on the Creco box, and furthermore Creco boxes will take any standard M. C. B. lid.

#### PACKLESS STEAM AND WATER VALVES.

The packless water valve, as made by the United States Radiator Corporation, Detroit, Mich., is something unique. It permits a full opening with less than one turn of the handle



Packless Steam and Water Valve

and has double protection against leakage by the packless washer. It has a graduated device by which the desired valve opening may be quickly adjusted. The accompanying illustrations give sectional views of these valves.

#### UNIVERSAL CAR SEAT.

The new pressed steel Universal car seat made by the Heywood Brothers & Wakefield Company, Wakefield, Mass., is in use on both steam and electric railways. These seats

are made entirely of wrought or malleable iron, pressed and dropped forged steel, no cast iron being employed in their construction; this tends to decrease injury from rough handling. They may be adapted to almost every service.

#### SARCO FOR REFRIGERATOR CARS.

Sarco, made by the Standard Asphalt & Rubber Company, Chicago, for refrigerator cars, is claimed to fill the following requirements for such a product, which are: It must be tasteless and odorless so that it may impart no taint or odor to the most delicate of the commodities carried; it must remain elastic under all variations of temperature, and adhere to the flashings and not crack or run; it must not be dissolved by liquids, gases or chemicals that are liable to be given off by the material carried; and it must not become dry and hard so that it will crack from vibration or age. With a poor grade of sealing, the transportation cost increases on account of the additional ice required and the deterioration of the products carried. The cost of re-icing a car once is claimed to pay the difference between a good seal and a poor one.

#### NEW STEEL FOUNDRY.

A foundry recently built at the Indiana Harbor plant of the American Steel Foundries, Chicago, is devoted entirely to making steel castings for freight cars. At the present time many designers of railway equipment specify steel castings for purposes where strength is required and at the same time light construction desired. Just as steel castings are being used more and more in locomotive and tender underground construction, in the same way their use is increasing in freight car construction, they being used for striking plates, corner plates, filler castings, draft sills and other parts requiring rigidity and ability to withstand shocks and strains incident to the present-day train service. As castings for this purpose are comparatively light in weight and are usually made in large quantities, they call for somewhat different foundry methods than is the case with the ordinary run of steel castings. This new foundry has modern molding machines and apparatus for the rapid and economical handling of castings. It contains an open-hearth furnace and a one-ton electric furnace for making very small or intricate castings which cannot always be made of satisfactory quality by the open-hearth process.



Foundry for the American Steel Foundries at Indiana Harbor, Ind.